

JPRS 79334

29 October 1981

USSR Report

AGRICULTURE

No. 1303



FOREIGN BROADCAST INFORMATION SERVICE

NOTE

JPRS publications contain information primarily from foreign newspapers, periodicals and books, but also from news agency transmissions and broadcasts. Materials from foreign-language sources are translated; those from English-language sources are transcribed or reprinted, with the original phrasing and other characteristics retained.

Headlines, editorial reports, and material enclosed in brackets [] are supplied by JPRS. Processing indicators such as [Text] or [Excerpt] in the first line of each item, or following the last line of a brief, indicate how the original information was processed. Where no processing indicator is given, the information was summarized or extracted.

Unfamiliar names rendered phonetically or transliterated are enclosed in parentheses. Words or names preceded by a question mark and enclosed in parentheses were not clear in the original but have been supplied as appropriate in context. Other unattributed parenthetical notes within the body of an item originate with the source. Times within items are as given by source.

The contents of this publication in no way represent the policies, views or attitudes of the U.S. Government.

PROCUREMENT OF PUBLICATIONS

JPRS publications may be ordered from the National Technical Information Service (NTIS), Springfield, Virginia 22161. In ordering, it is recommended that the JPRS number, title, date and author, if applicable, of publication be cited.

Current JPRS publications are announced in Government Reports Announcements issued semimonthly by the NTIS, and are listed in the Monthly Catalog of U.S. Government Publications issued by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Correspondence pertaining to matters other than procurement may be addressed to Joint Publications Research Service, 1000 North Glebe Road, Arlington, Virginia 22201.

Soviet books and journal articles displaying a copyright notice are reproduced and sold by NTIS with permission of the copyright agency of the Soviet Union. Permission for further reproduction must be obtained from copyright owner.

29 October 1981

USSR REPORT

AGRICULTURE

No. 1303

CONTENTS

MAJOR CROP PROGRESS AND WEATHER REPORTING

UkSSR Motor Transport Minister Details Beet Harvest Plans (F. P. Golovchenko; RABOCHAYA GAZETA, 30 Aug 81).....	1
Improved Harvesting Effort Expected in UkSSR (A. Denisenko; PRAVDA UKRAINY, 29 Aug 81).....	3
Scientists Prescribe Correct Handling of Beet Crop (V. Zubenko, N. Zuyev; SEL'SKAYA ZHIZN', 13 Sep 81).....	6
Sugar Mills Are Readied for Harvest (S. Luzgan; SEL'SKAYA ZHIZN', 10 Sep 81).....	7
USSR Durum Wheat Production Outlined (ZAKUPKI SEL'SKOKHOZYAYSTVENNYKH PRODUKTOV, Aug 81).....	8
Potato Crop, Harvest Notes From RSFSR (Editorial Report).....	18
Sugar Beet Harvest Progress in Belgorodskaya Oblast, Stravropol'skiy Kray (Editorial Report).....	19
Briefs	
Beet Harvest Goals Set	20
Local Beet Harvest Report	20
Good Beet Yield	20
Beet Harvest Begins	20

POST HARVEST CROP PROCESSING

Progress, Problems in Grain Procurement in RSFSR Noted (P. Merkulov; MUKOMOL'NO-ELEVATORNAYA I KOMBIKORMOVAYA PROMYSHLENNOST', Jun 81).....	21
Sugar Beet Processing in Moldavia Reviewed (V. M. Iovv; SAKHARNAYA PROMYSHLENNOST', May 81).....	27
Call To Limit Sugar Beet Losses in Bashkiria (S. Selyukov, Kh. Asadullin; SEL'SKOYE KHOZYAYSTVO ROSSII, Aug 81).....	33

LIVESTOCK FEED PROCUREMENT

Importance of Stress on Feed Production Discussed (F. Mirochitskiy; ZHIVOTNOVODSTVO, May 81).....	36
Improvements Required in Efficiency of Feed Production in Ukrainian SSR (V. Shamrinskaya; EKONOMIKA SOVETSKOY UKRAINY, Aug 81).....	41
Rostov Area Food Scraps Important Livestock Feed Resource (G. Gubanov; IZVESTIYA, 5 Sep 81).....	50

LIVESTOCK

Food Program, Animal Husbandry Development Discussed (L. K. Ernst; VESTNIK SEL'SKOKHOZYAYSTVENNOY NAUKI, Aug 81).....	55
Calculation of Live Weight in Delivery of Livestock Urged (A. Myshelova; ZAKUPKI SEL'SKOKHOZYAYSTVENNYKH PRODUKTOV, Jul 81).....	67
Current Tasks of Animal Breeding Centers Set Forth (ZHIVOTNOVODSTVO, Jul 81).....	74

REGIONAL DEVELOPMENT

Academician Vavilov Discusses Tasks of Agricultural Science (P. P. Vavilov; VESTNIK SEL'SKOKHOZYAYSTVENNOY NAUKI, Aug 81).....	79
--	----

AGRO-ECONOMICS AND ORGANIZATION

Importance of Adhering to Sound Agro-Economic Principles (A. A. Nikonov; VESTNIK SEL'SKOKHOZYAYSTVENNOY NAUKI, Aug 81).....	98
Organization, Structure of Agro-Industrial (Food) Complex for Estonia (M. Bronshteyn; KOMMUNIST ESTONII, Jul 81).....	109

Plans for Resolving Problems in Kazakh Agriculture (Ye. Zakshevskiy; NARODNOYE KHOZYAYSTVO KAZAKHSTANA, Jun 81).....	119
--	-----

TILLING AND CROPPING TECHNOLOGY

Urgent Crop Farming Problems, Soil Fertility, Grain Yields Discussed (N. P. Panov; VESTNIK SEL'SKOKHOZYAYSTVENNOY NAUKI, Aug 81).....	126
Determining Mineral Fertilizer Requirements, Optimum Distribution Using Computers (L. P. Dashkova, et al.; ZEMLEDELIYE, Jul 81).....	141

MAJOR CROP PROGRESS AND WEATHER REPORTING

UKSSR MOTOR TRANSPORT MINISTER DETAILS BEET HARVEST PLANS

Kiev RABOCHAYA GAZETA in Russian 30 Aug 81 p 1

[Article by F. P. Golovchenko, UkSSR minister of motor transport: "On Time and Without Losses"]

[Excerpts] The time has come to harvest sugar beets. This is a very important period in the life of farmworkers. After all, more than 1.7 million hectares in the republic have been planted to beets. Plans call for harvesting at least 312 quintals of the raw material and of producing 30.6 quintals of sugar from each of those hectares. Fulfillment of obligations depends in large part on organizing the operation of the transport conveyor. F. P. Golovchenko, UkSSR minister of motor transport, tells about this crucial aspect of the beet-harvesting campaign.

Beetgrowers are gratified by the present fall season. The crop is better than ever. So that the harvest is quickly delivered without loss to processing stations and sugar mills 30,700 trucks on a 3-ton basis are being allocated to help the farmworkers. They have quite a job ahead of them. During the season they must carry 20.65 million tons of the raw material of sugar.

A fleet of 9,700 trucks is being transferred into beet-growing oblasts. These are the routes they will follow. To Vinnitsa will come 4,600 trucks from Donetskaya, Voroshilovgradskaya, Zaporozhskaya and Khersonskaya oblasts. From the capital of the Ukraine Kiyevskaya Oblast will receive 800 pieces of transportation equipment. Ternopol'skaya Oblast will receive 1,700 trucks from L'vovskaya, Zakarpatskaya and Ivano-Frankovskaya oblasts, Khar'kovskaya Oblast will receive 1,200 from the city of Khar'kov, and Cherkasskaya Oblast will receive 800 trucks from Krymskaya Oblast. The date of their arrival on the spot is between 8 and 15 September.

In shipment of the "sweet" crop extensive use will be made of computer-calculated hourly schedules for hauling the roots, shovel methods of hauling using two-way trailers and semitrailers and large truck trains. Two-way radios have been installed in all the headquarters of administration and dispatcher centers that have been specially set up. In addition, a large reserve of repaired engines,

transmissions, and front and rear axles has been built up, 9,500 young drivers have been trained, and a special fund has been created for material incentives to reward drivers who distinguish themselves in the sugar beet harvest.

Officials of the Ministry of Motor Transport in the republic are doing everything necessary so that the harvest is carried out in a short time and without losses.

7045

CSO: 1824/479

MAJOR CROP PROGRESS AND WEATHER REPORTING

IMPROVED HARVESTING EFFORT EXPECTED IN UKSSR

Kiev PRAVDA UKRAINY in Russian 29 Aug 81 p 3

[Article by A. Denisenko, UkSSR deputy minister of agriculture: "The Combat Mission of Beetgrowers"]

[Excerpts] Soviet farmers, under the leadership of party organizations, have been persistently implementing the decisions of the 26th CPSU Congress and the 26th Congress of the Ukrainian CP and are striving honorably to fulfill their socialist obligations for the production and sale to the state of all types of products of cropping and animal husbandry. That will require dealing with a large number of urgent matters: harvesting corn, sunflowers, sugar beets and other late crops, preparing as much fodder as possible for socialized livestock raising, and laying a sound basis for next year's harvest.

The republic's beetgrowers are now taking a crucial test. They have made substantial efforts to grow a good crop of the sweet roots: They have achieved a high level of soil and crop practices, the soil has been fertilized generously, and machines have been extensively introduced. It is sufficient to say that 1.6 million of the 1.76 million hectares planted to sugar beets are being cultivated by mechanized teams.

Weather conditions at the present time have proved to be rather problematical. The growth of the roots was held back by the dry weather and high temperatures in July and the first 10 days of August. Moisture reserves decreased in the top meter of soil. In certain rayons of Odesskaya, Nikolayevskaya, Kirovogradskaya and Khar'kovskaya oblasts sugar beets were affected, the tops ceased to grow, and the leaves turned yellow. But in the republic as a whole the average weight of the root as of 20 August was 16 grams more than last year. In places where the crops were kept free of weeds the increase in the weight of the roots and the rise in its sugar content could be substantially greater than usual in September. Unfortunately, there are quite a few farms where beet fields have grown up in weeds. This cannot be tolerated.

The beet-harvesting campaign has already begun as a practical matter, but most of the work remains to be done.

The republic's kolkhozes and sovkhoses have to dig beets in September and October over an area of 1.74 million hectares, haul the roots to the receiving stations, and ensile the tops. During the autumn at least 50.5 million tons of raw materials for sugar need to be sold to the state. The principal measures have been worked out in the republic for harvesting the beets, for staging socialist competition among the teams of harvesting machines, truck drivers and operators and tractor drivers of machines used in putting the beets up for storage—all those who will be involved in this important effort. Dates have been set for starting up the sugar mills.

It is important now that every farm adhere strictly to harvesting schedules in the first period of digging—up to 15 September. During that period receiving stations should receive enough roots so that sugar mills can operate continuously with a 3-day stock of the raw materials. But after 15 September the schedules for harvesting the beets should be stepped up—this will ensure that harvesting and transport are done on schedule.

Present plans call for harvesting 1.6 million hectares of beets by the direct-flow and reloading methods. These technologies reduce to almost half the outlays of materials and money. All that remains is to properly organize the effort. Progressive experimental combine operators harvest the beets without hand-cleaning; moreover, the total impurity level of the beets does not exceed 6-7 percent, and the tops remaining represent only 1.5-2 percent. They achieve high quality thanks to regular adjustment of the combine so as to take into account the development of the plants, the condition of the soil and the weather conditions.

It is generally known that farms that permit a large gap between digging and shipment incur sizable losses. If roots are left in the field in small piles or pits after digging, they wither. In the dry season the uncovered beets lose as much as 3 percent of their weight per day, and that amounts to 10-15 quintals on every hectare. In addition, the dried roots that have lain in pits quickly spoil at receiving stations, their sugar content drops, and they become unsuitable for processing.

Hauling the beets will be a serious test for truck drivers. They must work so as to minimize the gap between digging and hauling. What are needed here are astute organization, efficient interaction among all the links in the sugar conveyor, widespread introduction of hour-by-hour schedules drawn up so as to take into account the flow capacity of receiving stations and the capability of loading equipment and vehicles.

We would like to emphasize that last year more than 1,000 drivers of trucking companies of the Ministry of Motor Transport delivered between 23 and 26 tons of roots over distances of 25-30 km. But the average indicator for that same ministry was only 15.5 tons even at distances of 19 km. Now more than 90,000 trucks and a large number of trailers will be carrying the beets. It is important, then, to be concerned about passing on the experience of drivers who have been innovators to all the drivers who will be involved in carrying the harvest.

with
Nor can we forget next year's crop: hauling fertilizers, deep plowing--these are very important jobs; after all, it is in the fall that the foundation is laid for high yields.

W. E. L.
It is the most important task of agricultural authorities, farm specialists, personnel of receiving stations and all beetgrowers to conduct the beet-harvesting campaign as though it were a combat mission, to bring in the harvest at the best time and without losses, and to furnish industry a high-quality raw material.

7045

CSO: 1824/479

MAJOR CROP PROGRESS AND WEATHER REPORTING

SCIENTISTS PRESCRIBE CORRECT HANDLING OF BEET CROP

Moscow SEL'SKAYA ZHIZN' in Russian 13 Sep 81 p 1

[Article by V. Zubenko, general director of the Scientific Production Association Sakhsvekla, and N. Zuyev, senior staff scientist of the All-Union Scientific Research Institute for Sugar Beets]

[Excerpt] This year the dry hot weather has had an adverse effect on formation of beet roots, has killed some of the plants and has disrupted their uniformity. As a rule the soil is compacted in the rows and between the rows, and on certain farms there is quite a bit of weediness in the beet fields. At the same time the abundant rains and showers which came later, especially in the western parts of the country, have promoted growth of the tops. Even now they are half a meter high over substantial areas, but the weight of the tops considerably exceeds the weight of the root. In such a situation crop losses could increase during harvesting unless necessary steps are taken, the processing qualities of the raw material could deteriorate, and the productivity of machines could drop.

The first thing to do is to correctly choose the period for harvesting, plan it in such a way as to obtain the maximum growth of the roots and maximum accumulation of sugar in them. The All-Union Scientific Research Institute for Sugar Beets has established that in the light of these factors the volume digging in the principal beet-growing zones of the Ukraine and in the northern Caucasus should begin 15-20 September and should be completed no later than 20-25 October. In the Central Chernozem Zone of RSFSR and in the northeastern and eastern regions of UkSSR the crop should be harvested from the fields between 15 September and 10 October. In the second half of September harvesting would be done only on rotating strips and passageways between animal enclosures, and the established schedule would be strictly adhered to in meeting the amount necessary for continuous operation of the sugar mills. During that period stocks of the roots should not exceed the 3-day capacity of the processing enterprises.

7045

CSO: 1824/479

MAJOR CROP PROGRESS AND WEATHER REPORTING

SUGAR MILLS ARE READIED FOR HARVEST

Moscow SEL'SKAYA ZHIZN' in Russian 10 Sep 81 p 1

[Article by S. Luzgan: "The First Sugar"]

[Text] The harvesting of sugar beets has begun in the Ukraine; this crop occupies more than 1.7 million hectares.

The volume harvest is to begin in the second 10-day period of September in order to obtain the maximum amount of sugar from every hectare. Beets are now being dug on rotating strips and passages between animal enclosures. The schedules for the harvest have been worked out so that every sugar mill is furnished no more than a 3-day stock of the raw material until the volume harvest begins.

The first sugar from the new harvest has been produced by mills in Poltavskaya and Kiyevskaya oblasts. All 13 enterprises in Ternopol'skaya Oblast processing beets have completed their tests in advance of startup. This work will be completed in the next few days by the personnel of enterprises in other oblasts.

The personnel of the republic's sugar mills, in close cooperation with the beet-growers and motor transport workers, have adopted the course of maximum yield of sugar from every hectare planted to sugar beets everywhere, following the example of the people of Yampol'.

An additional fleet of nearly 300 power shovels and 88 machines for stacking the beets in storage facilities have already arrived at beet-receiving stations. This will make it possible to process all the raw material in good time and at a high standard of quality.

Rotary beet washers and other machines have been installed at a number of plants for the first time in the country to be used in processing roots that are very dirty.

The personnel of all 189 sugar mills in the Ukraine have resolved to finish the sugar-making season in December.

7045

CSO: 1824/479

MAJOR CROP PROGRESS AND WEATHER REPORTING

USSR DURUM WHEAT PRODUCTION OUTLINED

Moscow ZAKUPKI SEL'SKOKHOZYAYSTVENNYYKH PRODUKTOV in Russian No 8, Aug 81 pp 1-5

[Article: "Increase the Production and Procurements of Durum Class Wheats"]

[Text] The wheat fields of our homeland are spread over much land—more than 60 million hectares of land. Entire countries, for example, France, Belgium, and Holland combined could easily be accommodated on the territory of these fields.

This chief food crop of the country is grown in different soil, climate zones. Great art is needed on the part of the farmer to grow a big harvest and obtain good quality grain.

However, there are zones where the natural conditions, as it were, themselves meet the farmer half way, making it possible with reliable agrotechnics to obtain the best high protein wheat in the world. They include the steppe areas of Kazakhstan, Western Siberia, and Southern Urals, the Povolozh'ye, and the Ukraine. It is in these areas that the best quality strong and durum wheats which are necessary for the production of high grade bread and confectionary and macaroni products are produced.

Showing constant concern for the growth of the well-being of the Soviet people, the communist party and the Soviet government have always devoted great attention to the development of grain farming. A further increase in the production of grain and an improvement of its quality is a component part of the party's food program for the 11th Five-Year Plan and for subsequent years. Durum wheat has an important place in the production and procurements of feed grain. Russian Durum wheats have long been famous on the world market for their high quality. They were the initial material for the selection of this crop in the United States and Canada.

It is difficult to overestimate the importance of Durum class wheats. They are the irreplaceable raw material for the production of special macaroni grind flour. High quality long-tubular macaroni is produced from this kind of flour. This requires Durum wheat grain which in its quality has to meet the norms of class I, that is, to have a grain condition of not less than 770 grams, gluten of not less than 28 percent no lower than quality group II, and the mixture with other types of wheat must not exceed 10 percent. For this reason, it is quite right that in producing high grade macaroni the Moscow Macaroni Factory No. 2 indicates on the finished output boxes: "Produced From Flour of the Best Grades of Durum Wheats."

State resources are experiencing a great need for Durum class wheat grain for the production of macaroni products in order to satisfy the growing demand of the population. In order to increase the production and procurements of Durum wheats high economic stimuli have been established: For grain which meets the requirements of quality class I the procurement price exceeds the price for soft wheat by 100 percent, class II--by 70 percent, and class III--by 20 percent. Durum wheat grain of quality class III is paid for at a price which exceeds the price of soft wheat by 10 percent in those oblasts, krais, and autonomous republics which have been given Durum wheat purchase plans.

What do the price relationships between the quality classes mean in practice? They mean that given an equal harvest one hectare of class I Durum wheat is equal in value terms to two hectares of soft wheat, 1.8 hectares of non-class Durum wheat, at almost 1.7 hectares of class III Durum wheat.

According to the calculations of economists, in Siberia the net income from the sale of a ton of soft wheat grain (at procurement prices in effect during the 10th Five-Year Plan) came to an average of 58 rubles, from a ton of strong wheat grain--88 rubles, and of class I Durum wheat--115 rubles; that is, almost twice as much as soft wheat and 30 percent more than strong wheat. If Durum wheat sowings were reduced and replaced by soft wheat a farm could lose 66 rubles of net income on each replacement hectare.

The enormous economic effect from improving the quality of Durum wheat grain is obvious and it is confirmed by numerous examples from the work practice of kolkhozes and sovkhoses. However, these advantages of Durum class wheats, as well as the positive experience connected with growing them, are being popularized and introduced into production very poorly.

A check which has been performed by specialists from the USSR Ministry of Procurements has shown that literally in all of the basic areas where Durum wheats are grown there are quite a few farms whose experience merits attention, support, and dissemination. These farms obtain not only large harvests, but also good quality grain on the bases of a complex of agro-technical and farm organization measures which provide them with substantial additional payments for the sale of class grain to the state. Tavicheskiy Rayon in Omskaya Oblast may serve as a good example of growing Durum class wheats. Last year from an area of 7,500 hectares the farms of this rayon harvested 27.8 quintals per hectare of Almaz grade Durum wheat (selection by Siberian Scientific Research Grain Institute) and sold the state 7,800 tons of class wheats. They received average monetary additions of 95 rubles and 60 kopeks per ton for the high quality of the wheats, which came to 90 percent of the basic purchasing price.

Striving to successfully carry out the decisions of the 26th CPSU Congress on increasing the production and procurements of Durum wheat grains, in Omskaya Oblast it has been planned to double the lands sown to them by the end of the 11th Five-Year Plan.

Unfortunately, as the check has shown, far from all local agencies used such initiative to introduce the advanced production experience with Durum wheats which has

developed on the farms of their own rayons and oblasts. In Kuybyshevskaya Oblast a substantial contribution to the fulfillment of the procurement plans for Durum (class) wheats is being made by the kolkhozes and sovkhoses of Stavropol'skiy, Volzhskiy, and Bol'sheglushitskiy rayons which have sold the state 64,000 tons of these wheats, having overfulfilled the procurement plan in the 10th Five-Year Plan by 28,000 tons. The kolkhoz "Pravda" in Stavropol'skiy Rayon sold the state 6,500 tons of Durum class wheat grain, having over fulfilled its five-year plan by 2.8 times, and, in addition, the proportion of class wheats in the total amount of the grain procurements of this crop came to 78 percent. However, in Kuybyshevskaya Oblast as a whole, its agricultural and procurement agencies did not ensure the fulfillment of the procurement plan for Durum class wheats during the last five-year plan: 160,000 tons, or 57 percent of the plan, failed to be sold by it.

During the five-year plan the kolkhozes and sovkhoses of Serafimovicheskiy Rayon in Volgogradskaya Oblast sold 10,400 tons of Durum class wheat, fulfilling the procurements plan by 148 percent. In selling the class grain the farms received, including the addition for quality, 154 rubles per ton, or 66 percent more than the procurement price for soft wheat. In Frolovskiy Rayon in the same oblast the five-year plan for the procurement of Durum class wheat grains was fulfilled by the farms by 182 percent. The "Archedinskiy" sovkhos got the highest indicators in the rayon: It overfulfilled the plan for the sale of Durum class wheats to the state by more than two times, receiving 197 rubles for a ton of class wheat (including the addition for quality), or more than twice the procurement price for soft wheat. Unfortunately, the experience of these farms was not taken up by others, and the oblast fulfilled the five-year plan for the procurement of class wheats by only 63 percent.

Last year the kolkhoz "Novyy Trud" in Varnenskiy Rayon, Chelyabinskaya Oblast, sold the state 2,467 tons of Durum class wheat, fulfilling its plan by 132 percent. This farm also overfulfilled its five-year plan, selling 8.7 tons of class I and class II grain, receiving pay additions of 92 rubles and 41 kopeks for each ton, and exceeding the purchasing price for soft wheat by 90 percent. However, Chelyabinskaya Oblast as a whole is far from these kinds of results: The plan for the procurement of Durum class wheat was not fulfilled by it neither in 1980 nor during the five-year plan as a whole. Moreover, the procurement of class wheat decreased here compared to the Ninth Five-Year Plan by 1.7 times.

High results were achieved by the farms of Adamovskiy Rayon in Orenburgskaya Oblast; they successfully fulfilled the five-year plan for procurements and sold grain of excellent quality, receiving an average of 91 rubles and 14 kopeks per ton in addition to the procurement price, or almost doubled their receipts. However, the oblast as a whole was not able to achieve such results: During the five-year plan it failed to sell the state 465,000 tons of Durum class wheat, or 35 percent of the procurement plan.

In the Bashkir ASSR active participation was taken in the procurement of Durum class wheat by the kolkhozes and sovkhoses of Sterlitamakskiy, Davlekanovskiy, Kumertauskiy, Kushnarenkovskiy, Meleuzovskiy, Miyakinskiy, and Federovskiy rayons. Occupying 38 percent of the Durum wheat procurements plan, during the last five-

year plan the farms of these rayons sold the state 190,500 tons of Durum class wheat, or 77 percent of the amount procured by this republic, fulfilling their contract commitments by 165 percent. However, the republic as a whole underfulfilled the Durum class wheat procurements plan during the last five-year plan.

Great attention to growing Durum wheat and organizing its procurements is being shown by the farms in Kuybyshevskiy Rayon in Kokchetanskaya Oblast which during the 10th Five-Year Plan sold the state 75,800 tons of Durum class wheat, or 18 percent more than established by the procurement plan. In this oblast good success has also been achieved by many kolkhozes and sovkhoses of Chkalovskiy, Arykbalykskiy, and Kzyltuskii rayons which obtained 22-30 quintals per hectare of Durum wheat grain and regularly fulfilled their commitments to the state.

However, in this oblast which has been successfully fulfilling its commitments on the sale of strong wheat as yet too little attention is being devoted to the production of Durum wheats and the dissemination in the rayons and on the farms of the positive work experience connected with this crop. It is not accidental that during the past five-year plan the Durum wheat procurements plan was under fulfilled in Kokchetavskaya Oblast by 195,000 tons, or by 46 percent.

In Fedorovskiy Rayon, Kustanayskaya Oblast, the sovkhos "Put' K Kommunizmu" obtained a gross Durum wheat grain harvest in 1980 of 5,479 tons from an area of 2,632 hectares (20.8 quintals per hectare) of which 4,364 tons, or 80 percent of the gross harvest, was sold to the state, which was 1,164 tons, or 36 percent, more than the procurement plan for these wheats. First class sales came to 4,100 tons of grain, or 94 percent, for which the sovkhos was paid price additions of 356,500 rubles, or an additional 86 rubles and 94 kopeks per ton. During the 10th Five-Year Plan the farms of this rayon received as price additions for selling the state high quality Durum class wheat grain 6.3 million rubles, or 54 rubles, 22 kopeks per ton.

However, in the oblast as a whole the procurement of Durum class wheat not only did not increase during the 10th Five-Year Plan, but even decreased in comparison with the Ninth Five-Year Plan by 160,000 tons, or by 1.7 times.

The "Mikheylovskiy" sovkhos in Vishnevskiy Rayon, Tselinogradskaya Oblast, also achieves a high level of profitability for its production of Durum wheat. During the past five-year plan it sold the state 6,976 tons of Durum wheat, of which 6,299 tons, or 90 percent of the procured amount, was of high quality. For every ruble of expenditures the sovkhos received one ruble 83 kopeks of net profits, while it received one ruble 12 kopeks from the sale of soft wheat, and only 32 kopeks from the sale of barley, although the yield of the latter was 1-1.6 quintals per hectare greater. On the whole, during the 10th Five-Year Plan Tselinogradskaya Oblast failed to provide state resources with 140,000 tons of class wheat grain, or 48 percent of the procurement plan.

The above-cited data convinces one that in all of the basic areas of Durum wheat production high quality grain can be grown with a large economic effect for farms.

Durum wheat is a crop that is demanding with regard to natural conditions and growing technology. Yet, as checks and reporting data show, the necessary attention is not being shown to it and it is being lost among other grain crops. In many areas the actions performed by agricultural and procurement agencies in organizing the production and procurement of Durum wheat do not have the necessary direction and are poorly coordinated. Very frequently the growing of high quality Durum wheat is a matter solely of the personal initiative of the leaders and specialists of individual farms and areas.

In certain oblasts the workers of agricultural and procurement agencies attempt to explain the unsatisfactory state of the production and procurement of Durum wheat from the position of "bottlenecks": A shortage of mineral fertilizers, harvesting and grain cleaning equipment, and even...of fallow land, frequently not taking note of the fact that Durum wheat is being placed in areas with unsuitable natural conditions and is planted after poor predecessors. As a result of violations of the principles of the placement of grain crops in crop rotations in Durum wheat lots, grain mixtures containing soft wheat and barley are frequently to be found, which makes such lots unsuitable for the production of macaroni flour.

A great deal of Durum wheat does not meet class requirements on account of low content and poor quality gluten, discoloration, and other reasons. In addition, an inadequate fight against plant pests and diseases is not the least important element in reducing harvests and in the quality deterioration of Durum wheat grain. The neglected state of Durum wheat seed growing gives rise to much anxiety.

Scientific institutions have worked out farming systems for many regions. However, their slow introduction is holding back the creation of rich soils for growing high quality Durum wheat. The grain from this kind of wheat which is coming in through procurements is still marked by a large degree of heterogeneity in its quality indicators. Take, for example, the situation which has developed with grain quality in Volgogradskaya Oblast. During the past five-year plan for every ton of class wheat which was sold to the state the local farms sold more than five tons of low quality grain and for this reason did not fulfill their procurements plan. An analysis shows that the Durum wheat grain which was sold had sharp fluctuations in its quality characteristics. For example, according to the data of the State Grain Inspectorate, in the 1978 harvest year the difference between individual models in the natural weight of the grain of these wheats reached 153 grams from non-condition to high conditions. The content of gluten fluctuated from 18 to 30 percent, and, moreover, more than 45 percent of the procured Durum wheat contained less than 22 percent of gluten in the grain, that is, did not meet the requirements of the standard even for III—the lowest class.

Last year for every ton of class wheat state resources received almost 23 tons of non-class wheat from the farms of Danilovskiy Rayon in this oblast. The grain was discolored and low condition. It should be observed that some workers do not attribute importance to discoloration of grain if other characteristics of it satisfy the quality requirements. However, this kind of point of view is mistaken. Color for Durum wheat is a characteristic of quality. The discoloration of grain (whitening or darkening) occurs as a result of standing too long on the root, of a failure to comply with the harvesting and threshing schedules, and of open storage on threshing floors involving repeated moisturization and drying. Discoloration

results in a decrease in overall translucence and condition weight, a deterioration in the quality of the gluten, and also in the formation of coarse grains during processing.

Last year the Filonovskiy grain products combine accepted 2,984 tons of Durum wheat grain from farms, of which only 228 tons were class grain. The wheat did not meet the requirements of the standard because of the low quality of its gluten (third group) and the existence of an increased mixture of soft wheat and barley. It is known that these mixtures even in small quantities worsen the macaroni qualities of Durum wheat. For this reason, in class I, for example, not more than 10 percent of a mixture of soft wheats is permitted, and not more than two percent of barley. This is one of the important reasons why in placing Durum wheats in crop rotations they must not be alternated with sowings of soft wheats and barley.

As is known, Durum wheat grain with a gluten content of quality group III is not suitable for the production of macaroni products. Damage to the grain by the shield bug plays a considerable role in worsening the quality of the gluten. A content of 2-3 percent of the grain which has been damaged by this pest makes this kind of grain unsuitable for macaroni production. Meanwhile, during individual years of the 10th Five-Year Plan in Volgogradskaya, Kuybyshevskaya, and Orenburgskaya oblasts the presence of grain which has been damaged by the shield bug reached 14-18 percent. However, the fight against this dangerous pest is not being conducted actively enough. For example, according to the data of the local plant protection station, last year in Orenburgskaya Oblast work against the shield bug was done on only 28,000 out of 528,000 hectares of sowings on which there was an average of 10 specimens of the pest per square meter. Meanwhile, according to the data of the Scientific Research Institute of Agriculture of the Southeast, with an average inspection density (one bug per square meter) the Durum wheat harvest is reduced by more than three quintals of grain per hectare as a result of injuries and there is a sharp deterioration in its quality. It has also been established that when unthreshed grain is kept for a long time in windrows a deterioration of quality occurs not only from the influence of deposits (through the leaching out of endosperm substances), but also from increased damage to the grain by the shield bug. It has been observed in research that for every day wheat remains on the field grain injuries increase by four percent. This is why in order to avoid losses and a deterioration of grain quality it is recommended that Durum wheat be moved during its wax maturity phase, and picked immediately after the drying of the grain mass.

However, the failure to fulfill procurement plans for class Durum wheat is caused not only by the low level of agrotechnics, but frequently by the placing of sowings in less suitable soil and climate conditions. For example, during the 10th Five-Year Plan, with the existence at them of procurement plans for Durum class wheat, the farms of Penzenskaya, Tambovskaya, Lipetskaya, Kurskaya, Voronezhskaya, and Ul'yanovskaya oblasts and of the Tatar ASSR practically did not sell wheat of this quality: During this period 1,594,000 tons of non-class wheat was received from them, which comprises 49 percent of the Durum class wheat which failed to be provided by the entire Russian Federation. As a rule, the grain which is obtained here is discolored, has a low translucence, contains only 10-15 percent of gluten, is primarily of quality group III, and is not suitable for the production

not only of macaroni but also of baking flour, with the result that it is used basically for the production of combined feeds. Despite this, Durum class wheat procurement plans have again been established for the above-named oblasts for 1981.

But mistakes in placing Durum wheat are also made in the basic production regions for this wheat where there is every possibility of obtaining high quality grain. Analyzing the reasons for the worsening of the quality of Durum wheat grain in these regions, a group of scientists led by Academician A.I. Barayev believes that this situation has to a large extent been fostered also by the moving of Durum wheat from steppe areas to forest-steppe and pre-mountain areas with a better moisture level, that is, with a more stable yield capacity. In the book "Spring Wheat" (Moscow, "Kolos," 1978) they write: "A decrease in the Durum wheat sown areas in the steppe zone, or the disappearance of this wheat and its removal to more moist conditions, is characteristic to one or another degree for all areas. As a result of this, the quality of Durum wheat grain has become worse and the procurements of class grain have decreased."

Here is how one-sidedly, from the quantitative point of view only, the question of placing Durum wheat was decided, for example, in Orenburgskaya Oblast where the procurement plans for this wheat were to a substantial extent moved from the steppe to the more moist rayons. During the 10th Five-Year Plan Durum wheat sown areas in the oblast decreased by 103,000 hectares, chiefly in the steppe rayons, although the experience in growing Durum wheat and the positive evaluations of the Orenburg Scientific Institute of Agriculture confirm that the soil and climate conditions of the eastern, central, and southern zones of this oblast make it possible to obtain the best quality class grain. During the years 1971-1974, when the rayons of the eastern steppe zone were given Durum wheat procurement plans, they sold the state 73,000 tons of class wheat grain; moreover, 73 percent of it belonged to the highest I and II classes. We have already named Adamovskiy Rayon as one which is successfully continuing to raise and obtain high quality Durum wheat grain. However, of the seven rayons which along with it are members of the eastern zone, five do not have Durum wheat procurement plans. In the southern zone, of five rayons, only one is engaged in the production and procurement of Durum class wheat, while the others are also standing aside from the solution of this important state problem. It is not accidental that of its procured Durum wheat grain Orenburgskaya Oblast had 64 percent low quality and non-class and, for this reason, was not able to fulfill its five-year plan for sales to the state.

Similar shortcomings in placing Durum wheat procurements plans were permitted in Saratovskaya Oblast. In this oblast the production of Durum wheat was concentrated in the more moist rayons of the Right Bank of the Volga, while the possibilities of the steppe rayons of the Left Bank were inadequately used. As a result, during the past 10 years the farms of 18 rayons of the Right Bank have not sold the state a single ton of Durum class wheat, while the kolkhozes and sovkhozes of the Left Bank--of Krasnokutskiy, Ivanteyevskiy, and Pugachevskiy rayons--have been producing quality grain year after year and have sold 136,500 tons of class grain on their five-year procurements plan, fulfilling their commitments by 159 percent. Although belatedly, the Saratov people understood the shortcomings of this kind of placement and in 1981 concentrated the production of Durum class wheats in the steppe rayons. However, what has been lost cannot be gotten back:

The farms delivered to state resources Durum wheat in which 66 percent of the grain was of low quality, as a result of which Saratovskaya Oblast failed during the five-year plan to give the state 400,000 tons of class grain, or 57 percent of the plan. In neighboring Kuybyshevskaya Oblast, for the same reasons, the proportions of non-class wheat in the procurements came to 80 percent.

To date the placing of the production and procurement of Durum wheat has not been put into good order in Altayskiy Kray whose farms during the last five-year plan failed to give the state 585,000 tons of class Durum wheat, or 96 percent of the plan. This kind of result is not accidental: It is directly dependent upon the fact that 91 percent of the total procured Durum wheat was non-class and had a low grain quality and, for these reasons, was counted in the procurement plan as ordinary soft wheat.

In the Russian Federation as a whole during the 10th Five-Year Plan the proportion of low quality grain in Durum wheat procurements came to 77 percent.

The level of the organization of seed growing exercises a serious influence on yields and on the quality of Durum wheats and, in the final analysis, on the fulfillment of procurement plans. We have already said that seed growing for Durum wheat is in many areas in a neglected state. In Volgogradskaya Oblast the selected seed growing farms have not been fulfilling the established assignments for the production of high quality Durum wheat seeds. Some of these farms are only on paper as seed growing ones, while in fact they do not even sow Durum wheat and no one has held the leaders of these farms responsible, although many kolkhozes and sovkhoses in the oblast have remained without seeds. A characteristic example in this respect may be served by Surovikinskiy Rayon in the same Volgogradskaya Oblast. In this rayon the "Surovikinskiy" sovkhos, which had been selected as a seed growing farm, did no work at all on growing Durum wheat seeds throughout the entire 10th Five-Year Plan, and, as a result, five farms out of the seven in this rayon which had plans for the sale of Durum wheat grain to the state established for them did not, as a result a lack of seeds, even sow them during the past five-year plan.

The farms of Mikhaylovskiy Rayon in the same oblast also do not have high quality Durum wheat seeds. The sovkhos "Sosnovskiy," which is a seed growing farm in this rayon, did not sow Durum wheat and did not deliver seeds to the state to meet its procurement plan and contract agreements.

As a result of this kind of irresponsibility in providing the farms of the rayon with Durum wheat seeds the area sown to this crop decreased from 10,800 hectares in 1976 to 3,800 hectares at the end of the five-year plan.

The existence of serious shortcomings in the organization of the production of Durum wheat in Volgogradskaya Oblast, violations of state discipline, and numerous instances of lack of control and of an incorrect and unprincipled attitude toward this important matter by local agricultural and procurement agencies resulted in the fact that during the past five-year plan the plan for the sale of class wheat was fulfilled by only 30 kolkhozes and sovkhoses out of 176 which had contract commitments; moreover, 96 farms, or more than one-half, did not sell a single ton.

During this period the state failed to received 45,000 tons of class grain.

During the 10th Five-Year Plan in certain regions of the country, instead of an expansion of Durum wheat sowings, there was even a reduction. Thus, in Saratovskaya Oblast the Durum wheat sown area during this period decreased by 140,000 hectares, or by 24 percent, and in Chelyabinskaya Oblast--by 154,000 hectares, or by 71 percent. It is not accidental that in this oblast the average annual gross harvest of Durum wheat was 34,000 tons, or 27 percent, lower than the procurements plan. During the same period, in Kustanayskaya Oblast the Durum wheat sown area was reduced by 74,000 hectares, or by 53 percent, and the gross harvest was 144,000 tons, or 65 percent, less than the procurements plan.

In the country as a whole the Durum wheat sown area decreased during the 10th Five-Year Plan by 1,278,000 hectares, or by 29 percent; but, from this area, even with the low yields which had taken form, it would have been possible to harvest around an additional 1.8 million tons of class wheat, or triple their resources, and, on this basis, reduce no less than an additional 900,000 tons of macaroni and meet the needs for it of tens of millions of people.

In addition to the shortcomings in the organization of the production of Durum wheats, special note has to be taken as a serious omission in the work of agricultural and procurement agencies of the still unsatisfactory organization of the preliminary evaluation of the quality of Durum wheat seeds.

As early as 1977 the USSR Ministry of Procurements, by the order of 8 September "On Additional Measures to Increase the Production and Procurements of Durum Wheat and Strong Wheat Grain," obliged the chiefs of grain product administrations and the directors of grain reception enterprises to organize everywhere a preliminary evaluation of strong and Durum wheat grain in accordance with the methodological instructions in effect, and to assist farms by sending them for the performance of this work a special group of laboratory workers who together with kolkhoz and sovkhoz specialists would survey Durum wheats on the fields and threshing floors. In addition, it was intended here, on the basis of the data of the preliminary evaluation, to bring about a correct formation of commodity groups of wheat for sale to the state on the basis of their quality and, thereby, to prevent instances of the mixing of high quality grain with grain from other groups.

The 26th CPSU Congress set the task of increasing the production and procurement of Durum wheat during the 11th Five-Year Plan. The fulfillment of this responsible task demands from agricultural and procurement agencies a decisive improvement of the production and procurement of high quality Durum wheat grain, the wide introduction of progressive technologies and advanced experience, and a strict and exacting attitude toward instances in which scientific achievements are ignored.

Attributing exceptionally great importance to these measures, the 26th CPSU Congress demanded: "To increase the responsibility of farm leaders and specialists, scientific research institution workers, and the workers of party, government, and agricultural agencies for the introduction into production of scientifically substantiated agricultural systems." This instruction applies in full measure to solving

the problem of improving the quality of grain and increasing the production and procurements of Durum class wheats.

In May of this year the USSR Ministry of Agriculture and the USSR Ministry of Procurements examined the situation which has developed in recent years with the formation of state resources of Durum class wheat grain and mapped out concrete measures to eliminate the shortcomings in the organization of work with this crop. In the Order No. 154/120 which was published on this question, "On Increasing the Production and Procurements of High Quality Durum Wheat Grain," for the agricultural and procurement agencies of the RSFSR and Kazakh SSR it is ordered:

to effect measures on the rational concentration of the production of Durum wheat on kolkhozes and sovkhoses in rayons which have the best conditions for growing it;

to ensure the introduction on farms of a scientifically substantiated complex of agrotechnical measures and of the advanced experience of kolkhozes and sovkhoses;

to achieve an improvement of seed growing for Durum wheat and, on this basis, to meet the needs of farms for high grade seeds;

to allocate and use in a top-priority order mineral fertilizers and pesticides for Durum wheat sowings.

The directors of grain reception enterprises are obliged to ensure the uninterrupted reception of Durum wheat seeds, the correctness of determining their quality, and punctual settlements for them with kolkhozes and sovkhoses. Durum wheat has to be placed at grain reception enterprises in closed units separately by quality classes and must be cleaned and dried beforehand as it is received.

Especial emphasis is being put upon the personal responsibility of the chief state inspector for procurements and agricultural product quality for exercising effective state control over the fulfillment of contract commitments for procurements of class Durum wheat grain.

Grain product administrations have to make use of existing monies from the material incentives funds to provide bonuses for workers who distinguish themselves in increasing state resources of Durum class wheats.

The party and the government have created in the country all of the necessary preconditions for the successful accomplishment of an important national economic task--an increase in the production and procurements of Durum class wheats to meet the constantly increasing demand for them. It is up to the agricultural and procurement workers of the Russian Federation and Kazakhstan and to a clear organization of control by the appropriate structural subdivisions of the USSR Ministry of Agriculture and USSR Ministry of Procurements. The interests of the country are imperiously dictating: The task must be accomplished in full.

COPYRIGHT: "Zakupki sel'skokhozyaystvennykh produktov," 1981

2959

CSO: 1824/481

MAJOR CROP PROGRESS AND WEATHER REPORTING

POTATO CROP, HARVEST NOTES FROM RSFSR

[Editorial Report] The potato harvest has begun in Kaluzhskaya Oblast. Over 10,000 tons of potatoes have been sent to the industrial centers. Combines diggers and motor vehicle transport have been concentrated in detachments and harvest complexes established according to the Ipatovskiy Method. They will harvest potatoes from an area of about 60,000 hectares. (Moscow TRUD in Russian 3 Sep. 81 p 1)

The harvest campaign has come to the potato fields of Kemerovskaya Oblast—dozens of mechanized complexes and links have begun digging up the potatoes. Hundreds of motor vehicles of increased capacity are guaranteeing the uninterrupted operation of the harvest conveyor. The crop farmers' main concern is to permit no losses. For this the potatoes are being delivered directly from the fields to preparatory storage and stores in Kemerovskaya Oblast. Quality control posts are active in the harvest. (Moscow SOVETSKAYA ROSSIYA in Russian 17 Sep. 81 p 3)

Competition among the potato growers in Bryanskaya Oblast is in progress. Each is striving to gather a thousand tons of potatoes. Four hundred fifty harvest transport complexes are at work on the fields. (Moscow TRUD in Russian 25 Sep. 81 p 1)

Harvest transport mechanized detachments are the primary feature trait of this year's campaign on the potato fields of Tul'skaya Oblast. The potato growers of Uzlovskiy Rayon, who are working as a single detachment, are in the lead in the potato harvest. The potato growers in Arsen'yevskiy and Shchekinskiy Rayons have gathered potatoes from half the fields. (Moscow PRAVDA in Russian 3 Oct 81 p 1)

Crop farmers in Ivanovskiy Rayon were the first in Ivanovskaya Oblast to finish harvesting potatoes. The success was made possible by the timely implementation of the experience acquired at the sovkhose imeni 50-Letiya SSSR. Having combined all the equipment into a single complex here they succeeded in making the harvest conveyor work in an efficient and well organized manner. Despite the bad weather the potato harvest was completed in 10 days. (Moscow TRUD in Russian 2 Oct 81 p 1)

CSO: 1824/026

MAJOR CROP PROGRESS AND WEATHER REPORTING

SUGAR BEET HARVEST PROGRESS IN BELGORODSKAYA OBLAST, STAVROPOL'SKIY KRAY

[Editorial Report] The sugar beet growers in Stavropol'skiy Kray have begun the harvest campaign. They have pledged to deliver no less than 1,000,000 tons of sugar beets to the sugar plants. Following the example of their grain-growing coworkers, large complex detachments have been organized everywhere. This allows them to compress the harvest schedule and preclude losses due to adverse autumn weather. (Moscow SOVETSKAYA ROSSIYA in Russian 17 Sep 81 p 3)

Enterprises in Shebekinskiy Rayon [Belgorodskaya Oblast] gathered the sugar beets from the entire 13,000 hectares in a short time—three weeks in all. The success was made possible by the growing technical might of the local kolkhozes and sovkhozes. They have 133 highly productive six-row beet harvesting combines, as well as powerful beet loaders and much other transport means at their disposal. All equipment is formed up into 30 large harvest transport complexes, working according to the Ipatovskiy Method. Sugar beets have been dug out on almost all fields in Belgorodskaya Oblast. (Moscow PRAVDA in Russian 3 Oct 81 p 1)

The crop farmers in Belgorodskaya Oblast were the first in the Central Chernozem to finish harvesting sugar beets, which occupied over 160,000 hectares. The intense campaign was conducted in an unprecedentedly short time, especially in Shebekinskiy, Veydelevskiy, Krasnogvardeyskiy, and Prokhorovskiy Rayons where they did this work in all in 3 weeks. Despite this summer's prolonged drought, many enterprises, creatively applying advanced agrotechnology, have grown and gathered an abundant crop. For example in Belgorodskiy Rayon they got 240 quintals of sugar beets per hectare. (Moscow SEL'SKAYA ZHIZN' in Russian 4 Oct 81 p 1)

CSO: 1824/027

MAJOR CROP PROGRESS AND WEATHER REPORTING

BRIEFS

BEET HARVEST GOALS SET--In accordance with the unified comprehensive plan for harvesting and processing sugar beets, the republic's machine operators began on 18 August the sample digging of the sweet roots. There will be 275 mechanized teams equipped with high-capacity combines, beet loaders and trucks operating by the direct-flow and flow-reloading methods. The decision has been made to ensure that the beets are hauled to receiving stations no later than the day after they are dug. Plans call for harvesting beets on 1,000 hectares every day, so that in the first period of the campaign enterprises will have a 2-3-day stock of the raw material. By 25 October the harvesting of sugar beets is to be completed in the republic. The socialist obligations of field crop workers call for selling 3.76 million tons of roots in the first year of the 11th Five-Year Plan and of bringing the sugar yield per hectare up to 40 quintals. [Excerpts] [Kishinev SOVETSKAYA MOLDAVIYA in Russian 20 Aug 81 p 1] 7045

LOCAL BEET HARVEST REPORT--All beet-growing farms in the oblast have begun to gather the harvest. More than 1,000 harvesting complexes have gone out into the fields. The kolkhozes and sovkhoses have been allocated 5,000 trucks to haul the raw material. [Excerpt] [Moscow SE.'SKAYA ZHIZN' in Russian 11 Sep 81 p 1] 7045

GOOD BEET YIELD--The volume harvest of sugar beets has begun on the farms of Saratovskaya Oblast. The industrial technology used in cultivating the beets has made it possible to grow a good crop. The highest yield--more than 200 quintals per hectare--was achieved on the Krasnoye Znamya Kolkhoz in Arkadakskiy Rayon, whose director is P. Shishkanov, Hero of Socialist Labor. As much as 900 tons of the sweet roots are coming in for processing every day from the beet-growing areas. [Text] [Moscow GUDOK in Russian 20 Sep 81 p 1] 7045

BEET HARVEST BEGINS--Harvesting machines have gone into the beet fields of Orel'skaya Oblast. The farmworkers have made good preparations for bringing in the crop. Equipment was repaired in good time, about 300 harvesting and transport complexes and teams were created. They have highly productive combines and beet loaders at their disposition. [Text] [Moscow GUDOK in Russian 15 Sep 81 p 1] 7045

CSO: 1824/479

POST HARVEST CROP PROCESSING

PROGRESS, PROBLEMS IN GRAIN PROCUREMENT IN RSFSR NOTED

Moscow **MUKOMOL'NO-ELEVATORNAYA I KOMBIKORNOVAYA PROMYSHLENNOST'** in Russian No 6, Jun 81 pp 4-6

/Article by P. Merkulov, RSFSR minister of procurement: "Results and Prospects"

/Text/ Every congress of our party reviews the results of the work done and determines the tasks for the future. The years following the 25th CPSU Congress have shown that the Leninist general line of the party is implemented confidently and the tasks advanced at the congress, on the whole, have been solved successfully.

The workers of agricultural and procurement organizations and of grain receiving and processing enterprises of the Russian Federation also added their page to the annals of the glorious achievements of our nation.

As a result of the persistent and selfless labor of kolkhoz members, sovkhoz workers and specialists and of the large-scale organizational work done by party and Soviet bodies, the average annual volume of grain crops received by state resources increased by 13.1 percent, as compared with the Ninth Five-Year Plan, including of wheat, by 10 percent, of rice, by 25 percent and of corn, by 14 percent. The grain of fodder crops received by state resources increased, that is, barley, by 29 percent and oats, by 52 percent.

Kolkhozes and sovkhozes in Krasnodarskiy Kray and Orenburgskaya Oblast made great advances. During the past 5-year period they sold more than 1 billion poods of grain crops to the state.

Sverdlovskaya, Amurskaya, Moscow and Leningrad Oblasts, Primorskiy and Khabarovskiy Krays and the Bashkir, Mariyskaya, Kabardino-Balkarskaya, Severo-Osetinskaya, Checheno-Ingushskaya, Dagestanskaya and Kalmytskaya Autonomous Republics fulfilled the assignment for the sale of grain established for the 10th Five-Year Plan.

Kolkhozes and sovkhozes in Stavropol' and Rostovskaya, Volgogradskaya and a number of other oblasts also made a weighty contribution to grain procurement.

The work done on an increase in the production and procurement of wheat of strong varieties, especially in Krasnodarskiy and Stavropol'skiy Krays and Orenburgskaya and Amurskaya Oblasts, produced its results--the purchases of this wheat increased 4.8-fold.

During the 10th Five-Year Plan almost 22 million tons of high-grade seeds were procured, or 9.1 percent more than during the previous five-year plan. The procurement of corn increased by 35 percent and of seeds of oil crops, by 55.8 percent.

The commissioning of seed cleaning plants and shops of a capacity of 1,700,000 tons and of chamber dryers of a capacity of 152,000 tons per season and the improvement in the organization of work--all this contributed to the fact that 27.2 percent more seeds of the first- and second-categories of the sowing standard were prepared during the past five-year plan than during the Ninth Five-Year Plan. Extensive work on the development of the material and technical base and on the preparation of seeds of high sowing specifications was done at the enterprises of the Belgorod, Volgograd, Tula, Kurgan and some other administrations of grain products.

During the 10th Five-Year Plan the volume of industrial production increased by 26.6 percent and the production of high-grade flour, by 2.3 percent, of superior-grade flour, by 23.6 percent and of hulled and rolled products, by 14.7 percent. Industrial output worth 353 million rubles in excess of the control figures of the 10th Five-Year Plan was sold and 667,300 tons of high-grade flour and 1.8 million tons of superior-grade flour were produced in excess of the assignment.

As a result of reconstruction, improvement in the technological process and rise in production discipline, the production of superior-grade flour increased 1.5- to 2-fold at the enterprises of the Irkutsk, Khabarovsk and Bashkir Administrations of Grain Products and the selection of superior-grade flour was brought up to 28 or 36 percent at the flour milling plants of the Moscow City, Leningrad and Ul'-yanovsk Administrations of Grain Products, while its average output at the republic's enterprises comprised 19 percent. A significant increase in the production of high-grade flour was attained at the enterprises of the Orlovskiy, Moscow Oblast, Tula, Kuybyshev, Stavropol' and Krasnodar Administrations of Grain Products.

During the 10th Five-Year Plan the production of mixed feed increased by 51.2 percent, of mixed feed for poultry, by 70.6 percent and of mixed feed for animal husbandry complexes, 3.6-fold. The personnel of the enterprises of the Vladimir, Belgorod, Voronezh, Saratov, Volgograd, Krasnodar, Rostov, Stavropol', Krasnoyarsk and Altay Administrations of Grain Products made an important contribution to the fulfillment of the assignments for the production of mixed feed.

Substantial changes took place in the development of the material and technical base of the elevator, hulling-milling and mixed feed industry. A large number of grain storage facilities, basically elevators, were put into operation. The capacity of grain dryers was increased to 103,000 tons per hour. A total of 4,153 motor vehicle unloaders and 609 weighbridges were installed, 978 mechanized centers for the acceptance and shipment of grain were built and a large number of warehouses were equipped with stationary mechanization and with units for active grain ventilation. All this made it possible to greatly accelerate the flow processing of grain, to raise the level of mechanization of production processes and to improve the technical and economic indicators of the activity of grain receiving enterprises.

During the five-year plan the production capacity of flour milling enterprises was increased by 8,900 tons of grain processing in 24 hours and of mixed feed plants, by 28,900 tons of mixed feed output in 24 hours.

The work on the development of the material and technical base of enterprises located in the nonchernozem zone was done in greater volumes than during previous years.

Every five-year plan names its heroes--people of labor, who, sparing no time or effort, attain high indicators in work and generously transmit their rich experience to young people. Among the right-flank men of the 10th Five-Year Plan there are chief fine wheat flour technologists V. M. Zotikov at the Moscow Order of Lenin Flour Milling Combine No 3 and P. P. Yurochkin at the flour milling plant in Ramenskoye in Moscow Oblast; fine wheat flour miller V. I. Khudoyerko at the flour milling plant in Nevinnomyssk in Stavropol'skiy Kray; shift fine wheat flour millers A. A. Stepanov at the flour milling plant in Perm', V. N. Sidorenkova at the flour milling plant in Sovetsk in Kaliningradskaya Oblast and N. M. Rybina at the flour milling plant in Minusinsk in Krasnoyarskiy Kray; rollers V. B. Shevyakova, winner of the USSR State Prize, at the Yaroslavl' Grain Product Combine, Z. G. Filonova, at the Tula Grain Product Combine and K. S. Kuvshinova, at the Bugul'ma Grain Product Combine in the Tatar ASSR; screener N. N. Savel'yeva at the Novosibirsk Grain Product Combine No 2; sifters K. G. Masloboyeva at the Dzerzhinsk Flour Milling Plant in Gor'kovskaya Oblast and O. N. Zharova at the Saratov Grain Product Combine.

Notable grain dryers--N. S. Turchenkov, hero of socialist labor, at the Biysk Elevator in Altayskiy Kray, V. L. Gryaznov, winner of the USSR State Prize, at the Slavyansk Elevator in Krasnodarskiy Kray, N. N. Katunin, winner of the prize of the Leninist Komsomol, at the Aleysk Grain Product Combine, and others--attained remarkable production indicators.

The following worked well: laboratory technicians Ye. S. Guzik at the Svetlograd Elevator in Stavropol'skiy Kray and L. D. Lagoyda at the Tuymazy Elevator in the Bashkir ASSR; chiefs of technological production laboratories G. N. Gapon at the Troitsk Elevator in Chelyabinskaya Oblast, V. N. Vladimirov at the Slavgorod Elevator in Altayskiy Kray and L. M. Trofimenko at the Russko-Polyanskiy Elevator in Omskaya Oblast.

G. A. Shako, director of the Bolshevik Mixed Feed Plant, Ya. A. Grach, director of the Yaroslavl' Grain Product Combine, I. A. Smirnov, director of the Omsk Mixed Feed Plant, V. I. Storchak, director of the Gul'kevichi Grain Product Combine, N. S. Pirko, director of the Vladimir Grain Product Combine, V. I. Kondrat'yev, director of the Kurgan Grain Product Combine, K. S. Valyayev, director of the Aleysk Grain Product Combine, G. R. Bobrov, director of the Moscow Flour Milling Combine No 3, I. I. Regul'yarnyy, director of the Tula Grain Product Combine, V. Ya. Pechenov, director of the Ramenskoye Grain Product Combine and many others displayed the ability to efficiently organize production and to mobilize collectives for the fulfillment of the assignments of the five-year plan.

At the same time, while reviewing the results of the 10th Five-Year Plan and discussing achievements, we must not pass over shortcomings and difficulties in silence. Many farms do not ensure the fulfillment of the plans for the sale of grain to the state established for them and the obligations based on forward contracts. In some oblasts during the 10th Five-Year Plan the gross output of grain crops did not increase and in the East-Siberian Region even decreased somewhat.

Many farms systematically do not fulfill the plans for the sale of buckwheat, millet and brewing barley to the state and for this reason the possibility of improving the assortment of hulled and rolled products and of providing the brewing industry with high-quality raw materials is hampered.

In a number of oblasts the marketability of sunflowers is low, which leads to the nonfulfillment of the plans for their sale to the state.

The situation with the procurement of high-grade durum wheat is still unsatisfactory. The plan for the purchases of this wheat was underfulfilled, especially in large quantities, by the Tatar ASSR, Altayskiy Kray and Saratovskaya, Volgogradskaya, Kuybyshevskaya and Ul'yanovskaya Oblasts.

The situation with soft wheat for the production of high-grade flour received by state resources also evokes concern. Its amount even decreased in a number of regions, in particular in the Volga area, as compared with the Ninth Five-Year Plan.

In accordance with the decree of the CPSU Central Committee and the USSR Council of Ministers "On Measures for the Further Improvement in the Selection and Breeding of Seeds of Grain and Oil Crops and Grasses" a network of specialized seed breeding farms for the production and sale of seeds to the state was established in autonomous republics, krays and oblasts. However, even today about 50 percent of all the procured seeds are received by state resources from the republic's seed breeding farms. In varietal and sowing qualities they differ little from seeds received from nonseed breeding kolkhozes and sovkhozes. As a result, the plans for the purchases of high-grade seeds of grain crops have not been fulfilled in the last 2 years.

Work on seed preparation was not improved at the enterprises of the Kaluga, Ivanovo, Kirovsk, Krasnoyarsk, Amursk and a number of other administrations of grain products during the 10th Five-Year Plan.

Not all the commissioned enterprises mastered production capacities on the dates scheduled during the 10th Five-Year Plan. Some flour milling and hulling plants were idle for different reasons, mainly owing to inefficient work organization, and underfulfilled the assignments for the production of flour and hulled and rolled products.

The existing possibilities of improving the quality of output are not yet fully utilized in the mixed feed industry.

During the 11th Five-Year Plan state inspectorates for the purchases and quality of agricultural products, production administrations of grain products and grain receiving enterprises face critical tasks, the most important of which is the adoption of measures for drawing the maximum amount of grain meeting quality standards into state resources and for the fulfillment and overfulfillment of planned assignments and forward contracts for every crop by every farm. Serious requirements must be placed on grain receiving enterprises--contractors of grain crops and seeds of oil crops, grass meal and hay.

In 1985, as compared with 1980, the volume of production of superior-grade flour will increase by 39.7 percent, of hulled and rolled products, by 14.1 percent, of mixed feed, by 13.2 percent and of protein-vitamin additives, 5.1-fold.

Serious tasks have been set in the area of capital construction and the commissioning of production capacities. Plans are made to build new elevators, metal capacities and mechanized grain warehouses and to accelerate the rates of construction of grain drying capacities in regions of cultivation of sunflowers, corn and grain rice.

The capacities of milling, hulling and mixed feed enterprises will increase as a result of the construction of new and reconstruction and technical reequipping of existing ones.

Work on improvement in the technology of acceptance and processing of grain in flow on the basis of the introduction of highly productive equipment, overall work mechanization and automation of management and control of equipment and processes of grain cleaning and drying will continue.

It is necessary to increase the output of highly productive bucket elevators, to develop more productive separators and highly efficient grain dryers, to reconstruct receiving devices with the installation of powerful AVS-50M motor vehicle unloaders, to accelerate the development of instruments for an express and precise determination of grain quality and to increase the volumes of loose flour transportation.

A big program for the social development of grain receiving and processing enterprises is to be carried out.

To execute the decree of the CPSU Central Committee and the USSR Council of Ministers "On the Further Development and Increase in the Efficiency of Agriculture in the Nonchernozem Zone of the Russian Federation in 1981-1985," plans have been made to allocate 19 percent more capital investments for the new construction, reconstruction and technical reequipping of enterprises in this zone than during the 10th Five-Year Plan. Flour milling enterprises of a total capacity of 4,735 tons of grain processing in 24 hours, mixed feed plants of a productivity of about 20,000 tons in 24 hours, a number of other production facilities and dwellings of a total area of about 300,000 square meters should be put into operation.

The fulfillment of the construction plan approved for 1981 will guarantee a successful accomplishment of the tasks of the new five-year plan. In connection with this the main task of republic (ASSR), kray and oblast administrations of grain products lies in fulfilling, as well as overfulfilling, the plans for the development of the elevator, milling-hulling and mixed feed industry, as well as for the commissioning of dwellings of an area of 125,500 square meters, and so forth.

A wide popularization of the experience, which has proven its value, in the elaboration of schedules for the construction and commissioning of production facilities and housing by enterprises together with contracting organizations, a prompt transfer of planning estimates to builders and a regular financing of construction projects will contribute to an increase in the efficiency of utilization of capital investments.

Large-scale work on improvement in the organization of construction carried out by the economic method lies ahead.

The work of Roszagotspetsmontazh and Roszagotspetsremstroy trusts should be improved and an unconditional fulfillment of the assignments for new construction, reconstruction, technical reequipment and installation of equipment should be ensured.

A constructive and creative approach to construction and high mutual demands and efficiency in the solution of arising problems will ensure the maximum increase in fixed capital per ruble of invested funds.

Comrade L. I. Brezhnev noted the following in the accountability report of the CPSU Central Committee to the 26th party congress: "Intensification of the economy and increase in its efficiency, if this formula is translated into the language of practical affairs, lie primarily in seeing to it that the results of production increase more rapidly than the expenditures on it and that more could be obtained with comparatively smaller resources drawn into production."

The strengthening of state, labor and financial discipline, strict fulfillment of the established plans, improvement in analytical work, intensification of demands and increase of responsibility for the assigned job, strict observance of the policy of economy of labor, monetary and material resources, study of advanced experience and its generalization and popularization are of great importance for the accomplishment of this task.

Providing enterprises with skilled personnel and establishing stable collectives are necessary conditions for a successful realization of the outlined plans. During the 10th Five-Year Plan the enterprises of the RSFSR Ministry of Procurement were reinforced with specialists with higher and secondary technical education. Many workers studied at the Institute for Improvement of Skills, at courses and directly at enterprises.

A reduction in personnel turnover and the labor activity of everyone depend primarily on the attention to enterprise workers and to young specialists and on the concern for their labor, rest and improvement of occupational skills. The responsibility of managers of enterprises and organizations for the selection, disposition and education of personnel should be increased.

The collectives of state inspectorates for the purchases and quality of agricultural products, administrations of grain products and grain receiving and processing enterprises, inspired by the decisions of the 26th CPSU Congress, widely expanded the socialist competition for the fulfillment of the assignments of 1981 and the 11th Five-Year Plan as a whole.

COPYRIGHT: "Mukomol'no-elevatornaya i kombikormovaya promyshlennost'", 1981

11,439

CSO: 1824/466

POST HARVEST CROP PROCESSING

UDC 664.121.004.12

SUGAR BEET PROCESSING IN MOLDAVIA REVIEWED

Moscow SAKHARNAYA PROMYSHLENNOST' in Russian No 5, May 81 pp 43-46

[Article by V. M. Iovv: "The Quality of the Agricultural Raw Material Is the Basis for Increasing the Efficiency of the Agroindustrial and Food Complex"]

[Text] In his address at the October (1980) Plenum of the CPSU Central Committee, Comrade L. I. Brezhnev, general secretary of the CPSU Central Committee and chairman of the Presidium of the USSR Supreme Soviet, accenting attention to the question of preparing the food program, said: "This is a program which is supposed to bring together the development problems of agriculture and those of the industries which serve it, procurements, storage, transportation and the processing of agricultural products, the problems of developing the food industry and those of the food trade. As has already been said, this agroindustrial and food complex must be planned, must be financed, and must be managed as a single entity so as to ensure high final results."

The final results of the activity of enterprises in the food industry depend on the quality of the raw material that comes from agriculture: increasing the yield of the product per unit of the raw material, better utilization of production capacity, higher labor productivity and lower cost of the final product.

Improvement of the quality of the raw material as a factor in increasing the yield of the finished product plays a particular role for enterprises processing agricultural raw materials. For instance, a 1-percent rise in the sugar content of beets would make it possible at the present volume of its processing in the USSR to obtain additional output amounting to about 800,000 tons of sugar.

At the same time, in recent years the quality of the raw material reaching enterprises of the sugar industry in the country has shown a tendency to decline. For instance, the average sugar content of beets in the country as a whole has dropped in recent years 2-3 percent compared to 1965. The average sugar content of beets in 1980 was more than 3 percent below 1965 in Moldavia.

The problem of increasing the quality of the raw material for the food industry requires that a set of interrelated measures be carried out. One of them is to improve selection and seed-growing work. Even though there are two scientific research institutes and some 30 certified seed-growing and specialized

experimental selection stations and 232 seed-growing farms involved in selection and seedgrowing in the field of sugar beet production, high-yield sugar beet seed is furnished for less than half of the area planted to sugar beets.

To improve the grade of crops in the zones from which food enterprises receive their raw materials there must in the raising and harvesting of agricultural raw material be strict observance of the rules and requirements of agronomy; proper crop rotation, cultivation of the soil and treatment of crops and plantings, and optimum deadlines must be adhered to for commencement of the beet harvest and for production of sugar.

This enhances the role of the raw materials divisions of the sugar industry; they are the ones to guarantee the necessary inspection and to extend aid to the farms.

We will analyze the principal qualitative indicators for production of sugar beet and sugar from it in the years of the last four 5-year plans by taking Moldavia as an example (see Table 1).

Table 1

<u>Indicator</u>	<u>1961-1965</u>	<u>1966-1970</u>	<u>1971-1975</u>	<u>1976-1979</u>
Average gross beet harvest, thousands of tons	1,821	2,567	2,835	3,241
Average yield of beets, quintals per hectare	207	257	279	283
Average sugar content of the beet on acceptance, % of beet weight	18.90	18.18	17.22	16.17
Sugar yield, % of beet weight	14.21	13.29	12.13	11.04

It is evident from the figures in Table 1 that the average yield increased from 207 quintals per hectare in the 1961-1965 period to 283 quintals per hectare in the 1976-1979 period, while the average sugar content of the beet dropped in those periods from 18.90 to 16.17 percent, and the yield of sugar dropped from 14.21 to 11.04 percent.

It has been established that sugar production in Moldavia is unprofitable when the sugar yield drops below 12 percent, so that urgent measures need to be taken now to improve the quality of the sugar beet, above all to increase its sugar content.

Some specialists in agriculture assert that the sugar content of the beet drops when the yield is increased, and conversely, that the sugar content of the beet increases when the yield drops; this functional relationship is not observed in practice.

Indicators of the yield, sugar content and production of sugar per hectare are given in Table 2 for 1973 and 1980 in Moldavian SSR.

Table 2

<u>Indicator</u>	<u>1973</u>	<u>1980</u>
Output of sugar from beets, thousands of tons	365.50	282.00
Area planted to sugar beets, thousands of hectares	98.00	106.00
Average yield of beets per hectare, quintals	248.00	248.00
Sugar production per hectare, quintals	37.29	26.03
Sugar content of the beet on acceptance, % of beet weight	17.93	16.00

The figures given in Table 2 show that in 1980, when the average yield was the same as in 1973, the sugar content of the beet and the production of sugar per hectare were 2.0 percent and 11.26 quintals per hectare higher, respectively, in 1973 from land of the same quality.

An economic analysis of operation of the Moldavian sugar industry in recent years shows that the level of the sugar yield from the beet depends on numerous factors in both agricultural production and also industrial production, but it is principally influenced by the length of the processing season and the dates when digging of the beets and operation of the sugar mills begin.

Experience over many years and computations confirm that beet sugar production is extremely unprofitable in the first 6 months of the years of recent 5-year periods, when there is a sharp drop in the sugar yield, and this detracts from the technical-and-economic indicators for the processing season.

Digging the beets of the 1978 harvest began on 1 September, the processing season started on 6 September, and the processing season ended on 9 January 1979; for beets of the 1979 harvest the corresponding dates were 1 September, 4 September and 21 January 1980.

Table 3 presents figures on the processing of beets and the yield of sugar in the 1978/79 and 1979/80 processing seasons for the Moldavian sugar industry.

Table 3

<u>Indicator</u>	<u>Second Half 1978</u>	<u>First Half 1979</u>	<u>Processing Season</u>	<u>Second Half 1979</u>	<u>First Half 1980</u>	<u>Processing Season</u>
Beets processed, in thousands of tons	2,620.90	66.10	2,681.00	2,296.90	91.30	2,388.20
Sugar yield, % of beet weight	12.50	8.70	12.41	10.93	2.76	10.62

The drop in the sugar yield because of operation in the first half of the year was 0.09 percent for the 1978/79 processing season.

As we see from Table 3, Moldavia's sugar mills processed 66,100 and 91,300 tons of beets in the first half of 1979 and 1980, respectively, and the sugar yield was 8.7 and 2.76 percent of beet weight, respectively.

In this case, because of the low sugar yield as compared with the actual yield in the second half of the previous year (the sugar yield in the second half of 1978 was 10.93 percent and in the second half of 1979 11.51 percent), the shortfall was 2,412 tons of sugar in 1978 and 7,403 tons in 1979. Similar things have occurred in previous processing seasons.

These sugar losses might not have occurred if the processing season had begun just 1 week earlier.

According to our calculations, it is best for beet harvesting to begin on 28 August.

It has been proven in the economics literature that early digging of beets is the most efficient.

For instance, according to data of VNIISP [All-Union Scientific Research Institute of Beetgrowing] in the period from 28 August to 1 September sugar production increases from 35.20 to 35.39 quintals per hectare in Moldavia.

Were the digging of beets to begin according to our recommendation, the average loss would be about 2 tons of sugar; earlier beginning of its processing would increase sugar production by 9,815 tons.

With the capacities that exist for processing beets, and taking the coefficient of utilization of capacity that has been achieved over the period under consideration, the processing of sugar beets could be finished before the new calendar year.

In addition, reduction of the time that beets are processed in the winter season affords the possibility of considerably reducing the losses of beets and of the sugar they contain, which during that season increase sharply because of unfavorable conditions, which tend to intensify microbiological processes.

Many years of experience in the operation of sugar mills shows that under Moldavian conditions, given the volume of procurement of beets and capacities for processing them as they have existed in recent years, sugar beet production is optimally done only in the second half of the year and operation in the first half would be entirely eliminated.

For the Moldavian sugar industry it is optimum for the harvesting of the beets to begin on 28 August and to be adjusted to the current demand of the mills for the raw material based on a 3-day reserve and for industrial processing to begin on 1 September, the period of volume harvesting to begin on 1 October and for the harvesting and shipping of the beets to be completed by 5 November.

In the 1976-1980 period enterprises of the Moldavian sugar industry processed about 13.5 million tons of beets. On the basis of the coefficient of utilization of capacity achieved in the second half of those years, that volume of beets can be processed in 507-510 days, i.e., the length of sugar production would be no more than 105 days per processing season.

If we take into account the projected average annual beet harvest in Moldavian SSR, which is set at 4.1-4.2 million tons over the 1981-1990 period in the Basic Directions, and the planned growth of productive capacity for sugar production over the same period, the optimum dates we have recommended for commencement of harvesting and processing of beets are altogether acceptable.

A sizable potential exists for increasing the quality of the raw material in improving the system of incentives for production of high-quality products.

Probably a premium should be paid not only for fulfilling and overfulfilling the plan for the gross harvest of sugar beets, but also for improving the quality indicators of the raw material and above all for achieving high indicators for the sugar content of the beets. This will make it possible to increase the production of sugar per hectare of area planted, as has been envisaged in the Basic Directions for the Economic and Social Development of the USSR Over the Period of 1981-1985 and up to the Year 1990.

In making the transition to acceptance of sugar beets so as to take into account their sugar content particular attention should be paid to how clean the beets are.

The indicator of impurities has not been revised for many years and continues to remain rather high--10 percent of beet weight. This 10 percent consists of approximately 1 percent tops and 9 percent dirt. Since the optimum percentage of impurities is included in the plan for the volume of the gross beet harvest, beet-growing farms make no effort to reduce the amount of impurities and every year carry from the fields an enormous amount of topsoil.

Aside from impoverishing the soil, this involves colossal shipping costs, adds to the time of industrial processing of the beets and increases the wear on equipment of sugar mills.

In the 10th Five-Year Plan certain rayons in the republic, the Faleshtskiy Rayon in particular, delivered beets with a 5-7-percent level of impurity regardless of weather conditions and 3-5-percent when weather conditions are good. The time has come to reduce the allowed amount of impurities to the level attained by the workers in Faleshtskiy Rayon.

In addition, the problem needs to be solved of returning to the fields the fruitful chernozem carried off with the beets.

In recent years the Yampol' method has become widespread. Good results have been obtained from introducing the method in the beet-growing oblasts of the Ukraine, where efforts have been joined to resolve the problems of furnishing the farms seed from the new high-yield varieties, mechanizing the cultivation of beets, introducing progressive technology in sugar production and improving the processes in storing and processing the beets.

In 1979, a year that was unfavorable in its weather conditions, 39-42 quintals of sugar were produced from every hectare planted in Mironovskiy, Boguslavskiy

and Vasil'kovskiy rayons of Kiyevskaya Oblast, in Gusyatskiy Rayon in Terno-pol'skaya Oblast, and in Zhazhkovskiy and Chernobayevskiy rayons in Cherkasskaya Oblast. In Kiyevskaya, Cherkasskaya and Chernigovskaya oblasts as a whole this figure was 30.8-33.8 quintals per hectare, while in Moldavia, where sufficient attention has not been paid to progressive know-how, it was only 26.03 quintals per hectare.

It would seem that the time has come to take urgent steps to introduce effective measures to guarantee a rise in the quality indicators of sugar beets in the first years of the 11th Five-Year Plan, which will make it possible to achieve an increase in the sugar content of the beets and in the yield of the final product.

COPYRIGHT: Izdatel'stvo "Legkaya i pishchevaya promyshlennost'", "Sakharnaya promyshlennost'", 1981

7045

CSO: 1824/480

POST HARVEST CROP PROCESSING

CALL TO LIMIT SUGAR BEET LOSSES IN BASHKIRIA

Moscow SEL'SKOYE KHOZYAYSTVO ROSSII in Russian No 8, Aug 81 pp 23-24

[Article by S. Selyukov and Kh. Asadullin, staff members of the Central Scientific Research Laboratory of the USSR Ministry of Internal Affairs, Bashkirskaya ASSR]

[Text] In recent years much attention has been paid to increasing the production and improving the quality of sugar beets. In particular, provision has been made for introduction of more effective organization of work, an effective system of material incentives has been established (supplements to the purchase price, the proportions of bagasse, molasses, mixed feeds and sugar furnished to the beet suppliers at reduced prices). It would seem that this procedure should help to increase the volume of sugar beet sales. But in actuality certain oblasts are not coping with their planning targets. They include Bashkirskaya ASSR.

The reasons lie in the poor management of certain directors of kolkhozes and sovkhoses, in the inability to correctly organize the harvesting, shipment and storage, and also in the low yield from sugar beet plantations. Whereas the yield has increased for the country as a whole to 254 quintals per hectare in recent years, in Bashkiria it has risen only to 164. Though in the autonomous republic as a whole the area planted has been increasing, the gross harvest of sugar beets has been dropping. The reason for this is that frequently the seed material used does not meet standards. The sugar mills, violating their future contracts, are not furnishing the farms high-quality seeds of regionalized varieties. Some years in this republic as much as 30 percent of all the area planted to beets is sown to unregionalized varieties. The use of seed with low germination, especially single-sprout seeds, results in uneven and thin plantings.

Much is also lost in the harvesting and shipping of the crop. For instance, a second digging of the roots on the Vostok Kolkhoz in Ishimbayskiy Rayon produced 64 percent of the harvest, and the result was 42 percent on the Ural Kolkhoz in Aurgazinskiy Rayon. For the entire autonomous republic the losses were 66.8 percent of the entire amount of beets delivered.

One of the reasons that the roots remain in the ground is that harvesting equipment is imperfect. At the same time the beet remaining after the combine has

passed is not harvested as a rule on the same day. In the fields of the Iskra Kolkhoz in Kugarchinskiy Rayon, for example, this meant that 400 tons were left, on the Kolkhoz imeni Chapayev and Avangard Kolkhoz in Belebeyevskiy Rayon the remainder represented 6.4 quintals per hectare, and on the Kolkhoz imeni Tel'man the figure was 2 tons.

Losses of the product also occur because deadlines are missed for digging early beets. Some farms are so late in delivering them that the sugar mills are forced to begin the processing season after the planned date. For instance, last year the Chishmy and Meleuz plants were idle for 9 days for that reason and the Karlaman plant 12 days. In a number of rayons, on the other hand, volume harvesting is started too early. For example, on farms of Kushnarenkovskiy Rayon the schedule in the period of early procurement called for delivery of 700 tons, while the actual volume was 1,845. And kolkhozes in Miyakinskiy, Vizhbulyakskiy, Yermekyevskiy, Tuymazinskiy and Sharanskiy rayons delivered 400 tons of roots in the early period, though the plans did not call for them to deliver any products at all in that period. As a result of this "operational efficiency" the kolkhozes lost a minimum of about 800 tons of beet weight, which would have been added by further growth.

Unjustified waste also occurs because of improper storage of the beets. To be specific, 900 quintals of beets which had been dug were found in small uncovered storage pits in the fields of the Kolkhoz imeni Shaymuratov in Karmaskalinskiy Rayon. The roots consequently dried out, which means a loss of their weight and processing qualities. The farms suffer large losses because of tardy delivery of beets after digging. For instance, of the 20,000 tons of roots dug on the Pobeda and Pribel'skiy kolkhozes, the Kolkhoz imeni 50-Letiye SSSR, the Kolkhoz imeni Salavat and the Kolkhoz imeni Gafuri 7,200 had been left in small uncovered piles on the day when an inspection was made. It is no accident that of the total amount of low-standard beets delivered by farms of Meleuzovskiy Rayon, more than half proved to be dried out and was accepted by procurement people at a 20-percent reduction of price, which resulted in losses totaling more than 66,000 rubles.

The impurities included with the beets have a substantially effect on the beet weight that is paid for. For example, on one of the trips made by the Kolkhoz imeni Kirov in Chekmagushevskiy Rayon to the beet acceptance station 12 tons of beets were delivered. Of this weight 60 percent was dirt. The delivery from the Ural Kolkhoz was 56 tons of beets in which the level of impurities was 21 percent, 52 tons were delivered by the Arslanovskiy Sovkhoz with an impurity content of 23 percent, the Ak-Idel' Kolkhoz delivered 108 tons, in which impurities represented more than one-third. And something else is alarming: The total impurity content of sugar beets arriving for processing is rising every year. Whereas in 1975 this figure for the autonomous republic was 6.2 percent, in 1980 it was more than twice as high.

This situation results in distortion of reports and opens up loopholes for cheating those delivering the beets. For instance, personnel of the Karlaman Sugar Mill raised the percentage of impurities in beets received from the farms in Belozerskiy Rayon and concealed 150 tons of above-allowance losses of sugar.

Surpluses which have not been recorded make it possible for the plants to make sugar "on the side" and simply steal it. For example, the head of the warehouse, the chief engineer and the deputy chief bookkeeper of the Agara Sugar Combine were arrested for attempting to haul away 68 tons of the product without papers. Yet an inventory taken at the combine not only failed to reveal a shortage, but even established unrecorded surpluses of sugar amounting to more than 100 tons.

And one more bad aspect. In just 1 year 130,000 tons of fertile chernozem were carried away with the beets to beet-receiving points of sugar mills in Bashkirskaya ASSR. All because checks are made on every 10th truck of the farm. This procedure encourages a rise of abuses. They flourish mainly because the beet-receiving stations do not have approach roads and concrete roads to the storage bins. In rainy weather mud is formed which sticks to the trucks and creates "extra weight."

Another loophole is that truck scales are not in proper working order and the actual weight is given too low when they are weighed. For instance, at the Ak-senovskiy beet-receiving station a check of correct weighing showed that the woman who does the weighing increased by 1,050 kg the weight of an empty truck of the Kzyl-Bayrak Kolkhoz. Mud on the scale can in just 1 day deprive the kolkhozes of 1,025 tons of beets worth 47,000 rubles.

Nor are cases uncommon where there is a direct cheating of suppliers by laboratory assistants using various tricks. Even on the basis of incomplete data the farms in Bashkiria were cheated 380 tons for a total of 16,000 rubles. This happens because most of the farm representatives do not know the procedure and requirements of the state standards and cannot make a competent check on acceptance of the beets. The roots are often transported and delivered to beet-receiving stations by truck drivers enlisted from outside for the harvest season. The important thing for them is that they have only one task—to get rid of the load.

When these shortcomings have been corrected, the profitability of beet-growing farms can be increased considerably and the country's sugar production augmented. That is why this matter should be set to rights without delay.

COPYRIGHT: "Sel'skoye khozyaystvo Rossii", No 8, 1981

7045

CSO: 1824/480

LIVESTOCK FEED PROCUREMENT

UDC 633.2/.4

IMPORTANCE OF STRESS ON FEED PRODUCTION DISCUSSED

Moscow ZHIVOTNOVODSTVO in Russian No 5, May 81 pp 10-12

/Article by F. Mirochitskiy, Belorussian SSR first deputy minister of agriculture:
"Special Concern for Feed Production"/

/Text/ During the years following the March (1965) Plenum of the CPSU Central Committee the republic's party, soviet and agricultural bodies paid unabated attention to the development of animal husbandry. This sector has become a key sector in agricultural production and it gives more than one-half of the gross and three-quarters of the commodity output.

The process of intensification of specialization, development of cooperation and rise in the level of production concentration occurs at rapid rates in animal husbandry. Every year large capital investments are allocated for the sector's development, it is technically reequipped, industrial methods of production become widespread and the nature of labor of livestock breeders changes. Animal husbandry complexes and poultry factories have been built, existing farms have been reconstructed on a modern organizational and technological basis and the breeding qualities of animals have been improved.

During the past years milk production increased 1.9-fold, the number of livestock and poultry rose 2.7-fold and of eggs, 7.6-fold and the productivity of animals increased considerably. In the republic at present the per-capita production of milk is almost 640 kg, of meat, more than 90 kg and of eggs, 300. The increase in livestock products occurs owing to the rise in labor productivity and utilization of intensive production factors.

Nevertheless, the attained level and rates of development of animal husbandry by no means meet the population's rapidly growing needs. The sector's intensification level remains low. This is especially noticeable if the present level of development of animal husbandry is compared with the tasks that have to be accomplished in the next few years. "Basic Directions in the Economic and Social Development of the USSR for 1981-1985 and for the Period up to 1990," which were adopted by the 26th CPSU Congress, determined the new goals in the development of the republic's animal husbandry and envisaged an average annual production of 950,000 to 1,000,000 tons of meat (in carcass weight) and of 6.5 to 6.7 million tons of milk.

Of all the problems that will have to be solved during the 5-year period the problem of establishment of a firm feed base remains the most acute. Party, Soviet and economic bodies also paid much attention to this before. From 1965 through 1980 feed consumption in public animal husbandry increased from 7.9 million tons to 15.8 million tons of fodder units. There are 96 grams of digestible protein per fodder unit. Nevertheless, such a level does not fully provide animal husbandry with the necessary amount of feed. Therefore, fodder production is the most important sphere of activity. By solving this problem, the republic's kolkhozes and sovkhoses will be able to greatly increase the sector's efficiency. The 29th Congress of the Communist Party of Belorussia drew special attention to this.

Analyzing the tendencies that have occurred in fodder production in the last 15 years, it should be noted that this sector's development has been slow. While the total increase in feed consumed in animal husbandry was twofold, the production of local feed increased only 1.8-fold and of purchased feed, 4.5-fold. Its proportion in the total expenditure rose from 8 percent in 1965 to 19 percent in 1980. During those years the main stress was placed on an increase in the production of concentrates. Less attention was paid to an increase in the procurement of coarse and succulent feed. As a result, during that time the consumption of the former increased 3.7-fold and of the latter, only 1.7-fold.

During that period kolkhozes and sovkhoses did not take sufficiently energetical measures to improve the utilization of feed resources, to increase the nutritive value of rations and to lower losses of nutritive substances during feed storage, which led to a systematic increase in its expenditure per unit of output. In the last 5 years alone the expenditure of feed per quintal of milk increased by 8 percent, of beef, by 15 percent and of pork, by 7 percent.

As a rule, the annually obtained increase in feed was spent on supporting the life of the growing stock. Owing to the low level of feeding the productivity of animals is not growing and the absolute increases in the gross production of meat and milk are lowered from one five-year plan to another, although the number of livestock and the amount of consumed feed increases. At the same time, the indicators of labor productivity, of production costs and of the profitability of animal husbandry as a whole were lowered.

An overall program for the development of fodder production was worked out in the republic for the 11th Five-Year Plan. Main emphasis will be placed on an increase in coarse and succulent feed. Through an improvement in the quality and nutritive value of feed its expenditure per unit of output is to be lowered by 6 to 25 percent.

As before, paramount importance is attached to field fodder production, which right now accounts for two-thirds of the production of local fodder. At present sown areas under fodder crops occupy about 37 percent of the available arable land. In the next few years, basically, the areas under fodder root crops, corn for silage, annual grass and alternate and secondary crops will be stable. For the purpose of increasing digestible protein in feed, significant changes will be made within the groups of fodder crops themselves. For example, sowings in a mixture with pulse crops will be expanded in the group of silage crops. The proportion of lucerne and clover sowings in the group of perennial grass will increase from 25 to 75 percent, of lupin, peas and vetch in the sowings of annual crops, from 33 to 64 percent and of the cruciferae family in the group of alternate and secondary sowings, from 10 to 40 percent.

The areas under the sowings of pulse crops are to be almost doubled. Subsequently, the sowings of pulse crops will be expanded to amounts ensuring the following structure of local grain fodder: barley and oats, 64 to 65 percent, rye and wheat, 20 percent and pulse crops, 15 to 16 percent. With such a ratio in the grain part of a ration there will be 105 to 107 grams of digestible protein per fodder unit.

Plans are made to increase the yield of fodder crops during the 11th Five-Year Plan, as compared with the 10th Five-Year Plan--of root crops, by 48 percent, of silage crops, by 33 percent (including of corn for silage, by 47 percent), of clover and lucerne, by 49 percent and of annual grass, by 34 percent--and to bring it up to 340, 180 (200), 195 and 155 quintals per hectare respectively.

Hayfields and pastures, which occupy about 36 percent of all the agricultural land, should become some of the main sources and potentials of increase in the production of the cheapest high-grade feed in the republic. Through a large-scale implementation of measures for an improvement and correct utilization of meadows there is every possibility, as a minimum, to double their productivity and to bring the output of fodder units up to 30 quintals per hectare. Special attention will be paid to an increase in the yield of flood meadows. This will make it possible to meet 45 percent of the needs of the republic's farms for green fodder.

To ensure the planned increase in the yield of fodder crops and rise in the productivity of meadows, plans are made to implement a set of organizational and technical steps, where additional measures for a rise in the general standard of farming, especially for a system of soil cultivation and weed control and for an improvement in the utilization of fodder land, are put in the forefront.

An organization of the breeding of seeds of fodder crops, especially pulse crops, that is, lupin, peas, vetch, clover and lucerne, as well as such cereal grasses as cock's foot, awnless brome grass, fescue and reed grass, and other valuable types of leguminous and cereal grasses is a top-priority task in an increase in the efficiency of field and meadow fodder production. Most farms in the republic and specialized farms of Belsortsemprom and Belsortsemovoshch will engage in the breeding of seeds of grasses and other fodder crops.

During the current five-year plan the application of organic and mineral fertilizers to fodder crops is to be increased considerably and the volumes of liming are to be expanded. The application of mineral fertilizers to fodder crops will rise by 28 to 30 percent by 1985 as compared to the level of 1980. About 38 percent of their total amount necessary for application to fodder crops and land is to be annually utilized for topdressing hayfields and pastures. The volumes of application of chemical plant protection agents will increase. The volumes of mineral fertilizers planned for application to fodder crops will be found basically through a rational utilization among individual agricultural crops.

Measures to provide feed for livestock privately owned by citizens are envisaged. For this purpose it is necessary to have about 6 million tons of fodder units. The need for this feed will be met through the cultivation of potatoes, perennial grass and root and other crops on private plots, distribution of feed from the public sector on account of wages and allocation of pastures. Plans are also made to distribute mixed feed from state resources to the population in terms of 0.5 kg per kg of milk sold to the state and 1 kg per kg of pork in live weight delivered to procurement centers.

A wide introduction of modern feed production technologies is one of the top-priority tasks in a reduction of losses of nutritive substances during the procurement and storage of feed. Paramount importance is attached to an improvement in the methods of drying grass for hay. The method of active ventilation and pressing with mandatory preliminary crushing, especially of leguminous grasses, will become the basic technique of its preparation. In 1985 70 percent of the total amount of hay will be procured by the method of pressing and active ventilation.

By the end of the 11th Five-Year Plan the production of dehydrated feed will be brought up to 670,000 tons, including 400,000 tons of grass meal. The production of grass meal for sale to the state mixed feed industry will be carried out mainly on specialized farms. For this the republic is to have 75 to 80 specialized farms, each of which annually produces no less than 1,700 to 2,000 tons of grass meal. On these farms the structure of sown areas will be revised toward an increase in the sowing of grasses, especially leguminous grasses, and an expansion of irrigated areas.

Extensive work must be done to increase the efficiency of preparation of feed from sun-dried grasses and to improve the technology of its procurement and storage and the preparation of feed from grasses with the use of preservatives. As before, haylage will remain the most widespread method of preserving feed. The volumes of haylage procurement are to be brought up to 8 million tons, including up to 2.8 million tons in towers.

Large volumes of silage will be procured. By the end of the five-year plan its procurement will increase to 7.1 million tons. A reduction in the losses of the silage mass and an improvement in the quality of silage are the main tasks in silage procurement. All the procured silage is to be stored in faced trenches. Silage will be produced only with the use of nitrogen containing additives and preservatives. In the republic liquid preservatives are tested and in the Belsel'-khozkhimiya system plans are made for the construction of station warehouses for their acceptance and warehouses for the storage of preservatives at interrayon bases for the supply of chemical products.

Kolkhoz-sovkhoz and interfarm mixed feed enterprises of a capacity of 1 million tons, 1,800 fodder shops and 5 plants for the preparation of meat-bone meal are to be built. Storage facilities for hay for 1 million tons, haylage-silage trenches for 4.3 million tons, haylage towers for 2 million tons and storage facilities for 230,000 tons of grass meal, 350,000 tons of root and tuber crops and 200,000 tons of grain fodder will also be built. Considerable work will be done on the organization of specialized farms for feed production.

The fight for a reduction of feed expenditures per unit of output is one of the most important tasks in animal husbandry. An increase in the nutritive value of rations during the stabling period will be ensured as a result of the preparation of full-ration feed mixtures. All grain fodder is to be processed into mixed feed or utilized in the composition of full-ration feed mixtures. As before, mixed feed production will be carried out in two directions, that is, through an increase in the capacities of the state mixed feed industry and organization of mixed feed production on kolkhozes and sovkhozes on the basis of local grain and industrial additives. Shops for mixed feed production will be both farm and interfarm shops. The construction of mixed feed shops is considered advisable on large

specialized farms for the production of milk, beef and pork and for the breeding of heifers. The specific scheme for the distribution and construction of mixed feed shops and plants is developed and coordinated with the scheme for the distribution and construction of animal husbandry complexes.

Feed production is to be separated into an independent specialized sector. Permanent overall feed producing detachments consisting of technological links organized for the performance of work on the raising and procurement of all types of fodder, processing of raw materials and preparation of feed mixtures will become its basic nucleus. The functions of specialized subdivisions also include the performance of work on the preparation of soil, transportation and application of fertilizers, sowing and care of crops and fulfillment of the measures for an increase in the productivity of pastures and hayfields envisaged by technology.

Overall specialized subdivisions form the feed production sector in the organizational plan. Agricultural land (fodder crops on arable land, pastures and hayfields), manpower and material and technical resources and facilities, including units, equipment for the processing of raw materials and premises and capacities for the storage of feed, are attached to these subdivisions.

The specialist in feed production is the sector's direct manager and production organizer on the farm. Other specialists concerned with feed, as well as all structural subdivisions--detachments, links, laboratories for the quality of feed and enterprises for the processing and preparation of raw materials--are subordinated to him. Together with technological specialists, economists and engineers the sector's manager develops current and long-term plans, controls the fulfillment of assignments for the volume of production and procurement of feed of the envisaged assortment and quality, organizes work on the processing and preservation of raw materials and on the storage and preparation of feed, implements measures for an increase in the productivity of fodder crops on arable and meadow land and introduces the achievements of science and advanced practice for the purpose of obtaining the maximum amount of feed per hectare of land with the lowest expenditures of labor and funds per unit of output.

COPYRIGHT: Izdatel'stvo "Kolos", "Zhivotnovodstvo", 1981

11,439

CSO: 1824/468

LIVESTOCK FEED PROCUREMENT

IMPROVEMENTS REQUIRED IN EFFICIENCY OF FEED PRODUCTION IN UKRAINIAN SSR

Kiev EKONOMIKA SOVETSKOY UKRAINY in Russian No 8, Aug 81 pp 54-59

[Article by V. Shamrinskaya, candidate of economic sciences and senior scientific worker at Scientific Research Institute of Economics of UkSSR Gosplan: "Raising the Efficiency of Feed Production in the Ukrainian SSR.]"

[Text] During the 26th CPSU Congress, it was mentioned that one of the most complicated problems and one upon which the fulfillment of the food program is dependent is that of creating a stable and rich feed base for animal husbandry and converting it over to an industrial basis.

Throughout the course of the Tenth Five-Year Plan, a great amount of attention was focused on developing animal husbandry in the republic, strengthening its logistical base and transforming it into a specialized branch of agriculture. As a result, the average annual production of all types of feed during the 1976-1979 period and compared to the Ninth Five-Year Plan, increased for all categories of farms from 79.9 million tons of feed units to 91.4 million tons, or an increase of 14.4 percent. Moreover, the increase in feed resources has taken place at a more rapid rate than the increase in the number of animals. As a result, feed consumption per head of livestock has increased from 26.4 to 29.2 quintals or by 10.6 percent.

The annual cost of feed consumed in animal husbandry has reached a colossal amount -- more than 7.2 billion rubles -- or almost one half of all of the republic's material expenditures in agriculture. One out of every four rubles of overall production expenditures at kolkhozes and one out of every three at sovkhoses are used for the production, preparation and utilization of feed. This data clearly reflects the effect generated by reduced feed costs and the proper use of feed with regard to raising the efficiency of social production.

Meanwhile, the production costs for animal husbandry products are increasing annually in this regard and for the following reasons: annual increases in farm expenditures for all types of feed in field and fodder crop rotation plans and on natural feed lands; over-expenditures of feed per unit of animal husbandry output owing to low quality feed rations, unbalanced rations in terms of protein and amino acid structure, increased amounts of purchased feed on the farms and the annual increases in the cost of such feed.

During the 1976-1979 period, at kolkhozes in the UkSSR, the production costs for corn for grain, silage and green feed increased by 10 percent above the figure for

1971-1975, hay of perennial and annual grasses -- by 12-18 percent and fodder from grasses -- by 15-20 percent. As a result, each quintal of feed units fed to the animals during the years of the Tenth Five-Year Plan cost the kolkhozes an average of 6.81 rubles, compared to 5.52 rubles during the years of the Ninth and 4.13 rubles during the years of the Eighth Five-Year Plan.

The increase in the cost of feed is taking place mainly as a result of a negligible increase in the cropping power of the forage crops, against a substantial increase in the expenses for raising them -- for mechanization equipment and for the operation of such equipment (current repairs, fuel, lubricating materials, amortization deductions and so forth) and also overhead expenses. Moreover, the expenditures for acquiring mechanization equipment for feed production are increasing at a more rapid rate than the expenditures for live labor are decreasing in this branch. This is associated with the initial stage in the industrialization of feed production at the kolkhozes and sovkhoses, the intensified saturation of agriculture with equipment, the insufficiently efficient use of such equipment and also with the not always justified high level of prices for individual types of agricultural equipment.

At the present time, only individual production processes have been mechanized in the feed production branch and the technology for such mechanization on the whole and the form of labor organization for individual auxiliary operations at many farms remain at a low level. For example, the stacking of hay at kolkhozes is being carried out using mechanization equipment on only 67 percent of the areas and shocking -- on 52 percent of the areas. The removal and loading of silage has been mechanized 70 percent. A great amount of manual labor is being used for stacking the straw and loading it for removal from the fields and so forth.

The weak logistical base of feed production, the absence of the required system of machines and also the acute shortage of lined haylage and silage trenches (25-30 percent of the requirements), silage towers and containers for storing vitamin grass meal are producing a situation wherein up to 30-40 percent of the nutrients in the winter feed procured annually is irrevocably lost. According to data supplied by the Ministry of Agriculture for the UkSSR, during the 1976-1979 period, at kolkhozes and sovkhoses throughout the republic, 21-29 percent of the silage was categorized as 3d class in terms of quality and 7-10 percent was considered to be of low quality; for haylage the figures were 28-35 and 12-17 percent respectively and for hay -- 25-31 and 20-35 percent. More than one half of all grass meal procured in the republic is evaluated as being lower than 3d class in terms of its digestible protein content. In some oblasts, a considerable portion of the feed procured is of very low quality. For example, in 1979, 61 percent of the hay, 67 percent of the haylage and 90 percent of the grass meal in Krymskaya Oblast were evaluated as being of low quality or 3d class.

The following experiment was conducted at a commercial dairy farm of the Kolkhoz imeni 40-Letiya Oktyabrya in Gaysinskiy Rayon, Vinnitskaya Oblast. Forty selected cows of the same age, strain and productivity were divided up into three groups. One group was fed 1st class silage, another -- 2d class and the last group -- 3d class. As a result, the milk yields per cow and by groups were 15, 9 and 5 kilograms of milk respectively.

Experiments conducted by the Ukrainian Institute of Feed at a number of farms in Tul'chinskiy Rayon, Vinnitskaya Oblast, established the fact that livestock consume

no more than 30-35 percent low quality haylage and hay. For the republic as a whole, this results in a loss of hundreds of thousands of tons of animal husbandry products and in tremendous unproductive expenditures of material and labor resources.

Computations have shown that it is possible to increase the production of animal husbandry products by 15-25 percent simply by reducing feed losses. This circumstance is of tremendous national economic importance and it should be taken into account when selecting the optimum variants for employing capital investments for improving public animal husbandry.

Great and fruitful work associated with introducing into operations a scientifically sound system of feed production and improving the quality of the feed being procured is being carried out in Vinnitskaya, Kiyevskaya and Dnepropetrovskaya Oblasts. Here the recommendations of scientists and agricultural specialists have been developed and are being introduced into operations in connection with increasing the production and improving the quality of the forage on the farms. A large portion of the feed is produced by specialized detachments and teams. Many of these detachments and teams are introducing not only a system of material interest in improving the quality of the forage but also one of material responsibility for low indicators. As a result, 98 percent of the hay, 98 percent of the haylage, 77 percent of the silage and 80 percent of the grass vitamin meal procured in Dnepropetrovskaya Oblast in 1979 was of 1st or 2d class quality.

Despite the great amount of work that has been carried out in connection with introducing into production operations leading and progressive technologies for the procurement and storage of feed, the main portion of the republic's hay is still being procured by means of natural drying and storage in the field and this leads to a deterioration in its quality. In 1979, only 7 percent of the hay was procured using the method of forced ventilation and only 9.2 percent of the hay and 0.6 percent of the straw were pressed. A considerable portion of the haylage and silage is still being stored in unlined dirt trenches. In 1979, only approximately 40 percent of the haylage and 10 percent of the silage were covered by polymer plastic.

Meanwhile, owing to the absence of the required raw materials, only 35 percent of the capital investments made available in 1979 for creating concrete trenches for storing haylage and silage was actually used and for the 1976-1979 period as a whole -- only 78 percent. The requirements of the farms for the necessary machines and mechanisms are not being satisfied.

The considerable reduction in hay production that has taken place in past years should ideally be eliminated. It was this reduction which caused straw and haylage to become the principal coarse feed for ruminant animals.

From 1970 to 1979, the consumption of hay per forage cow decreased exactly by threefold -- from 2.4 to 0.8 quintals. Its proportion in the feed structure for cow rations at kolkhozes at the present time, in terms of food value, is only 1 percent (straw -- 10 percent, haylage -- 8 percent). Moreover, the rations for large-horned cattle in the Ukraine have on the whole been of a low concentration. Over the past few years, the proportion of concentrated feed in the rations of cows has not exceeded 25 percent in terms of food value and in the case of young stock -- even less. This has not promoted growth in the productivity of the cows, increased milk production or improvements in the effectiveness of the feed used.

Hay is the foundation for the feed base for large-horned cattle and particularly for dairy animal husbandry. In the absence of hay, it is impossible to obtain highly productive cows or normal development for young ruminant animals.

By the end of the current five-year plan, the production and complete preservation of no less than 10-12 million tons of hay must be ensured throughout the republic. This will require tremendous and intensive work both in the sphere of grass seed production, land reclamation and radical improvements in natural haying lands and also in connection with achieving considerable improvements in the logistical base, ensuring that the farms are provided with the necessary complex of hay harvesting equipment and introducing leading technologies for the harvesting and procurement of hay, for pressing it, for producing grass briquettes and also for preparing crushed hay. Reliable covering of the hay must be ensured in special storehouses or under sheds in the interest of improving its preservation and quality.

The introduction of progressive technologies for procuring hay and also timely harvesting operations are equivalent to an increase in its production. Thus, according to data supplied by the Ministry of Agriculture for the UkSSR and the Southern Branch of VASKhNIL [All-Union Academy of Agricultural Sciences imeni V.I. Lenin], for a cropping power of 35 quintals of hay per hectare the field drying of loose hay produces a yield of 12-13 quintals of feed units, pressed hay -- 17-18 quintals, with forced ventilation for loose hay -- 20-21 quintals and if the latter is pressed -- 23-25 quintals per hectare. The harvesting of alfalfa fodder during the budding phase makes it possible to obtain 22-26 percent protein in dry substance and, following blossoming, its content decreases twofold -- to 10-12 percent.

At the majority of kolkhozes and sovkhoses and throughout the course of the past two five-year plans, substantial qualitative improvements have not taken place in the sphere of feeding for all types of agricultural animals, nor has the principal requirement for the intensification of feeding been fulfilled -- that of raising the concentration of nutrients in the feed rations and achieving a balance in terms of their constituent components, as a result of which the consumption of feed for the production of a unit of animal husbandry output, just as in the past, remains rather high.

An analysis of the feed used by all types of animals at kolkhozes during 1979 has revealed that the animals obtain only 37 percent of their total amount of digestible protein from concentrates together with mixed feeds, 18.1 percent from succulent feeds 23.4 percent from green feeds and 15.8 percent from coarse feeds, of which amount 5.2 percent is obtained from straw and 5.7 percent from feed of animal origin and food scraps. Thus, feed of low nutritional value predominates in the rations. Mixed feeds, which constitute one half of the concentrates consumed, consist of grain components (80 percent) considered to be inferior in terms of their amino acid structure. In 1979 the proportion of strong protein additives in the mixed feeds decreased compared to the figure for 1975 and their ratio became worse (see Table). Their gross production lags behind the volumes of grain raw materials being sent to mixed feed enterprises for processing.

* Newspaper SIL'S'KI VISTI, 10 June 1980.

Average Content of Protein-Vitamin Additives Per Ton of Mixed Feed at State
Mixed Feed Plants in the UkSSR

	Years		
	1975	1979	1979 in % of 1975
Grass and coniferous meal	15.9	28.6	179.8
Cake and oil-seed meal	107.8	96.2	89.2
Meat-and-bone and bone meal	15.5	12.7	81.9
Fish and whale meal	18.2	8.2	45.1
Dry nutrient yeasts	18.7	17.3	92.5
Total	176.1	163.0	92.5

During the 1971-1979 period, the production capabilities of the state and inter-farm mixed feed plants in the Ukraine increased by several times. These enterprises increased their production of mixed feeds from 4 million tons in 1970 to 14 million tons in 1979. However the quality of this feed, at enterprises of all departments, did not meet the requirements set forth in the standards. Thus the farms at kolkhozes and sovkhoses are expending 1.5 quintals of feed units to produce 1 quintal of milk and for pork -- more than 10, including 7-8 quintals of concentrates. This surpasses by twofold the zootechnical and scientifically sound norms and the level achieved on leading farms throughout the republic and by foreign countries having developed animal husbandry systems.

Each year during the 1976-1979 period, the kolkhozes and sovkhoses of the Ministry of Sovkhoses for the UkSSR ended up with an average overexpenditure (compared to the feed consumption norms set forth in the national economic plan) of approximately 9.6 million tons of feed units, valued at 704 million rubles. The proportion of excess feed expended, compared to the overall amount actually consumed, was approximately 16 percent. And the overexpenditure of feed, compared to the scientifically sound zootechnical norms, which call for completely balanced rations, exceeds 17 million tons of feed units or 29 percent. This amount of feed alone would have enabled the republic's farms to obtain a minimum of 1.6 billion rubles worth of animal husbandry products annually.

A shortage of the required enrichment agent components for the mixed feeds is preventing the mixed feed industry from guaranteeing high quality in its products, which are constantly becoming more expensive. Thus the kolkhozes and sovkhoses are having to bear greater expenses in order to procure mixed feeds. From 1970 to 1979, the average cost for 1 quintal of purchased concentrated feed increased from 5.18 rubles to 11.96 rubles, that is, the price more than doubled. Each quintal of purchased mixed feed (including transport expenses) fed to the animals cost the kolkhozes an average of 12.27 rubles; this figure exceeded by almost twofold the production cost for the grain produced on the farms. The proportion of purchased mixed feed, compared to the overall volume used, reached 45 percent.

The successful solving of the problem concerned with raising the efficiency of feed production during the Eleventh Five-Year Plan must be promoted by the observance of three basic principles when planning the development of the republic's feed base:

-- the rates of growth for the production of all types of feed must exceed the rates of increase in the number of livestock, so as to ensure that no less than 35-40 quintals of feed units will be produced per conventional head of livestock;

-- growth in the consumption of concentrated feeds must take place at a more rapid rate than overall feed production and the proportion of concentrated feed in the feed balance should be raised to 40-45 percent;

-- an increase must take place in capital investments for the purpose of expanding considerably the production of high protein components of plant, animal and microbiological origin, without which it is impossible to make rational use of the principal bulk of feed, including grain. The digestible protein content in feed rations must be no less than 10-12 percent.

The development of animal husbandry must be carried out based upon radical changes in the feed base, consistent intensification of feed production and the conversion of animal husbandry into a specialized branch of the national economy.

During the April (1980) Plenum of the Central Committee of the Communist Party of the Ukraine, V.V. Shcherbitskiy commented that "We cannot recognize as correct a situation in which approximately 8 percent of the capital investments in agriculture are being used for developing our feed base. At the very least, the volumes of capital investments in feed production must be doubled." The economic effectiveness of such investments will be manifested fully only if use is made of a complex of measures for achieving a considerable increase in the feed yield obtained from a unit of fodder area, which must cover the additional expenses and bring about a reduction in production costs per quintal of feed. The largest reserve for increasing feed production is that of raising the cropping power of all types of forage crops in the sphere of field feed production, which at the present time furnishes the major portion -- up to 90 percent of all feed. The feed yield per hectare of fodder area must be raised to 45-46 quintals of feed units on the average for the republic. This will require making approximately one half of all reclaimed lands available for forage crops, increasing considerably the applications of organic and mineral fertilizers and raising the culture of farming.

During the Eleventh Five-Year Plan, special attention must be given to solving the protein deficit problem which, taking into account the losses which occur during storage, amounts to approximately 2 million tons of digestible protein annually in the republic. A requirement exists for achieving a rapid increase in the production of high protein agricultural crops and accelerating the development of those branches of the agroindustrial complex which are supplying animal husbandry with protein components of both plant and animal as well as microbiological and chemical origin.

In the "Basic Directions for the Economic and Social Development of the USSR During the 1981-1985 Period and for the Period Up To 1990," the plans call for an increase of 13-15 percent in the production of mixed feeds at state industrial enterprises during the Eleventh Five-Year Plan and for a twofold increase in the production of protein-vitamin additives. The plans for the microbiological industry call for a considerable increase in the production of marketable microbiological protein and lysine and also antibiotics for feed and veterinary purposes, feed vitamins,

fermentation preparations, premixes and other products of microbiological synthesis. The implementation of the measures planned will make it possible to lower the protein deficit considerably and to raise the effectiveness of feed usage.

The solving of this problem will require considerable capital investments and a strengthening of the feed base not only for agricultural feed production but for all branches of the feed industry.

The fastest and cheapest method for overcoming the protein deficit consists of increasing the production of plant protein by expanding the sowings of soybeans on irrigated lands in the south, pulse crops and lupine in the forest district and forest-steppe zone and also perennial grasses in all zones of the republic.

The all-round plan for the development of feed production in the Ukraine calls for the gross production of feed to be increased by a factor of 1.3 in 1985, including plant protein -- by a factor of 1.5.

During the past few years, a considerable expansion has taken place in the areas used for high protein perennial grasses which, compared to annual grasses, ensure a considerable increase in the fodder and hay yields. During the 1976-1979 period, the cropping power of perennial grass hay per hectare exceeded the cropping power of annual crops by an average of 6.6 quintals and fodder -- by 66.5 quintals. During the years of the Eleventh Five-Year Plan, the areas used for perennial grasses must be increased from 3 to 4-4.5 million hectares. This will make it possible to obtain (compared to annual grasses) more than 350,000 additional tons of digestible protein. A considerable increase in the production of perennial grasses will be possible only if improvements are realized in their seed production system and if it is converted over to an industrial basis.

Another important source for the production of additional plant protein is an increase in the areas used for pulse crops. Compared to cereal grain crops, the grain of pulse crops contains 5-6 times more lysine and two times more methionine. Thus the use of pulse crops improves the amino acid composition of rations considerably.

In the Ukraine, no more than 7 percent of areas set aside for grain crops is being used for pulse crops and their proportion of the overall mass of procured grain is only approximately 3 percent. As a result, the mixed feed industry is constantly experiencing a shortage of these components. Thus a firm policy should be persistently followed aimed at increasing the production of pulse crops in every possible way, by expanding their sowings to 10-12 percent of the grain fields and while simultaneously raising their cropping power.

It is noteworthy, for example, that in Vinnitskaya Oblast, which was the first oblast in the republic to compose and successfully implement an all-round plan for the development of feed production, peas as the chief protein crop occupies almost one fifth of the grain fields. The recently adopted decree on raising the state procurement prices for the principal grain and pulse crops is promoting a further increase in the production of peas. Commencing this year, the farms will be paid 25-36 percent more for their peas.

During the Eleventh Five-Year Plan, the pulse crop areas in the republic will be increased to a minimum of 1.5 million hectares. This will make it possible to harvest annually no less than 3-4 million tons of pulse crop grain containing 600,000-700,000 tons of digestible protein.

A most important crop, an increase in the sowings of which will promote the successful solving of the protein problem in the near future, is that of soybeans. No other crop in the plant fund used by man is its equivalent in terms of its content of rich protein, high quality oil and numerous vitamins, ferments and amino acids. In terms of its chemical composition, soybean protein is on a par with protein of animal origin and at the same time it is considerably cheaper.

Each quintal of soybeans serves to balance 8-10 quintals of forage grain in terms of the principal nutrients, making them rich in protein and raising considerably the return in the form of animal husbandry products. The experience accumulated in Krasnogvardeyskiy Rayon in the Crimea has shown that all of the production expenses for soybeans are returned one hundredfold through the sale of the soybean oil alone (10-20 kilograms from each quintal of soybeans) and thus the cake is viewed as a gift by the farms.

Up until recently, the principal reason for the limited cultivation of this heat-loving and moisture-loving crop in our republic was the fact that its cropping power was very low on non-irrigated lands in the southern part of the republic. The placing in operation of large irrigation systems has created a real opportunity for establishing specialized soybean production operations on large tracts of irrigated land in the southern part and forest-steppe zone of the Ukraine. According to data supplied by the Ukrainian Scientific Research Institute of Irrigation Farming, the cropping power of soybeans under irrigation conditions on dark chestnut soils in the southern steppe zone and over the past 10 years has amounted to an average of 25-29 quintals per hectare and on non-irrigated lands -- 7-12 quintals.

At the present time, there are approximately 2 million hectares of irrigated arable land in the republic. In addition, the plans for the current five-year plan call for the placing in operation of 500,000-510,000 more hectares of irrigated land and the draining of 640,000-680,000 additional hectares. Soybean varieties have been created and regionalized for 23 oblasts in the republic. Considerable experience has been accumulated in the cultivation of this crop in a number of oblasts and rayons, with 20-25 quintals of this crop being produced per hectare over large areas. Hence, objective prerequisites are available in the Ukraine for sharply increasing the production of soybeans and converting it into one of the republic's principal protein crops. In the near future, the cultivation of soybeans must be organized on an area of no less than 500,000-700,000 hectares, with the farms first being supplied with the necessary equipment, mineral fertilizers and herbicides. Here we have in mind the development and general introduction into operations of an industrial technology for the cultivation of soybeans, one which involves minimal expenditures of manual labor and is similar to the one which is presently being employed successfully in the cultivation of corn. Based upon concentration and specialization in seed production, farms must be created for the production of seed which will fully satisfy the requirements for high quality soybean seed.

A soybean yield of 20 quintals per hectare produces 580 kilograms of digestible protein and 43.4 kilograms of lysine. A yield of 73 quintals of corn or barley is

required in order to obtain such a quantity of protein. Moreover, the protein of corn contains seven times less lysine and when fed to livestock there must be a 20 percent overexpenditure of grain in order to obtain a unit of output, owing to its low nutritional value. In addition, when we take into account the fact that soybeans is an outstanding predecessor crop, leaving nutrients behind on a hectare of land that are equivalent to 15-20 tons of farmyard manure and that they furnish an increase in grain crop yield of 8-10 quintals per hectare, then it is completely obvious that the setting aside of 500,000-700,000 hectares of land for soybean usage during the next few years, at the expense of grain crops, is economically profitable and advisable. The shortfall in feed units resulting from the lower cropping power for soybeans, compared to grain crops, is compensated for by a savings in grain expenditures for the production of animal husbandry products. For an average cropping power of 15 quintals per hectare from these areas under crops, it is possible to obtain 0.9-1.0 million tons of soybeans, or approximately 700,000 tons of soybean cake containing approximately 260,000 tons of digestible protein. In order to produce such a quantity of digestible protein by means of industrial production, great capital investments would be required as well as an extended period of time. Thus, without negating the importance and need for further developing the microbiological industry and feed protein production in the republic, we nevertheless believe that the most economical and fastest method for increasing the availability of cheap rich protein is that of expanding the sowings and raising the cropping power of high protein crops.

COPYRIGHT: Izdatel'stvo "Radyans'ka Ukraina", "Ekonomika Sovetskoy Ukrainy", 1981

7026

CSO: 1824/478

LIVESTOCK FEED PROCUREMENT

ROSTOV AREA FOOD SCRAPS IMPORTANT LIVESTOCK FEED RESOURCE

Moscow IZVESTIYA in Russian 5 Sep 81 p 2

[Article by G. Gubanov: "9,300 Tons of Meat". Material between slant lines published in bold face type.]

[Text] Each year the subsidiary farms of enterprises in Rostovskaya Oblast obtain 9,300 additional tons of meat from the use of food scraps alone.

It bears mentioning immediately that during the past few years the interest in subsidiary farms has increased immeasurably in cities, villages and workers' settlements throughout the Don River region. The industrial enterprises are expanding the construction of their own animal husbandry departments: farms, poultry houses and even entire complexes for the fattening of livestock. /Today the kolkhozes and sovkhoses are selling to the population, for raising purposes, approximately 500,000 young pigs and up to 30 million head of various types of poultry. Together with the private plots of manual and office workers, the subsidiary farms of enterprises are providing considerable assistance in supplying the population with food goods/.

From Farmyards to a Complex

Let us examine how rural workers and the workers attached to industrial enterprises are managing their private plots. Here, use is being made of everything: the crust of grain crops, overripe or spoiled vegetables and fruit and small potatoes. In short, no table food scraps are being wasted, but rather they are ending up in the food troughs for swine, poultry, calves and cows. In the peasant yards, livestock and poultry can be raised and fattened using rations containing up to 80 and more percent of food, garden and other scraps. And these same "small scale food scrap production efforts" enable the oblast's cooperation specialists to procure up to 25,000-26,000 tons of meat from the population annually.

And what use is being made of the food scraps collected in the large cities? In Rostov-na-Donu, there are 4,500 dwellings having more than two levels, in which the collection of food scraps must be organized. Appeals to the residents, similar to the following, are to be found at the entrances to the dwellings:

/"Citizens! Gather up your food scraps, 4 kilograms of which, when added to the feed for swine, produce a savings of 1 kilogram of grain. Each ton of such feed makes it possible to obtain 45 additional kilograms of pork."/

"In principle, the technology of a city housewife in gathering up and using valuable food scraps" stated the manager of the oblast's office for non-planned feed V. Shostak, "is no different than the rural technology employed in our system. Everything that is left over from public and private dining tables and from the processing of milk at plants or the slaughtering of livestock at a meat combine, we are obligated to gather up, preserve, deliver to livestock fattening areas, process in the best form and feed to the animals. Based upon norms, it has been determined that each resident is capable of gathering up no less than 36 kilograms of food scraps that are suitable for the fattening of livestock. Planning is based upon this consideration. But in our Don River region there are 20 cities which have been assigned the task of collecting 72 kilograms per individual. As a rule, the cities are coping with this task. For example, there was not one month this year when the percent of fulfillment of the tasks was below 100. For example, our oblast was awarded a prize for the first quarter of this year for the completeness and volume of food scraps collected among cities in the RSFSR."

There are seven rayons in the oblast center. We visited each one of them, carried out random inspections of several multi-story buildings and we held discussions with workers attached to municipal housing establishments and housing administrations and with the drivers of special vehicles. And here is what we learned: /Plans and tasks for gathering up food scraps have literally been made available to each dwelling and entrance./ Many dwellings have been equipped with special areas where cans and other locally produced containers are kept. Special motor vehicles have been made available for removing this valuable feed. The drivers are quite familiar with their permanent routes, sectors and the point to which the food scraps are to be delivered -- the Bataysk complex for the fattening of swine. The results indicate that the citizens have learned to gather up this valuable feed and that they have accumulated considerable experience.

"For example, the residents of Rostov" stated the deputy chief of the Municipal Housing Administration Yu. Vlasov, "have for several years in a row been gathering up more than 50,000 tons of food scraps annually and in a stable manner. The residents of the city are building a large swine raising complex for 24,000 animals. The first phase has already been placed in operation and will make it possible to produce 1,180 tons of pork this year."

/The thrifty use of food scraps is making it possible not only to save a large quantity of valuable grain, but also to obtain every 30 out of 100 tons of pork through this means!/"

"Some city-dwellers" we were told by drivers attached to a specialized motor vehicle establishment, "are over-simplifying the use of the food scraps. They believe that once we have delivered the raw materials to a farm it is immediately unloaded into the feeding troughs. Nothing of the sort! The specialists and zootechnicians at a swine complex must first determine the quality of the food scraps and thereafter send them to a plant for processing. Only after this has been

done are the scraps fed to the livestock. The payments made are dependent upon the quality of the feed."

Mention should be made of the wages paid out to those who gather up the food scraps. The complex pays 15 rubles for each ton of food scraps. Of this amount, 4 rubles are transferred to the Office of Non-Planned Feed, 9 rubles and 50 kopecks are paid out to the yard-keeper and the housing administration receives one and a half rubles. Direct material interest exists in organizing the collection of food scraps. We repeat once again: the cities in the Don River region have learned how to gather up this valuable feed. However, let us proceed further and examine the entire technological chain, right up to the feeding troughs.

How is the Feed Delivered?

Considering the modern development of motor vehicle transport operations, it would seem to be a simple matter to deliver the feed collected to a farm or complex. However, it is considerably more complicated in actual practice. For example, in accordance with the norms the Rostov Specialized Motor Vehicle Enterprise of the municipal economy must make 18-20 motor vehicles available daily and yet only 10-12 are carrying out trips. Yes and the transport vehicles are not being utilized in a thrifty manner. And here is why: a large vehicle moves slowly from yard to yard and from dwelling to dwelling and a considerable amount of time is spent adding small loads to it. Thus, in the case of a complex which is located 32 kilometers from Rostov, a driver is unable to make more than two trips daily. Thus the productivity is lower than the potential. What is the solution?

At the present time, the soviets of people's deputies and their services are working out a practical program for organizing the transporting of food scraps. The time is at hand for having large mechanized sites to which the food scraps can be delivered, for example on freight motor scooters. At these sites, the scraps can be sorted and subsequently loaded onto trucks for shipment to a complex. There is an even better variant: to have small enterprises at these sites for processing the food scraps and preparing granulated feed from them. At a general collection point for the scraps, it would also be possible to organize modern washing of the packaging materials and to have other equipment available for the mechanization of labor. Moreover, it would be possible to create all-round brigades attached to the housing administrations and having a centralized system of management.

In short, the specialists and scientists are of the opinion that, under modern conditions with regard to the collection, processing and utilization of food scraps, the branch is becoming independent and requires, in the interest of the overall task, that all levels -- from a container to transport -- be concentrated in the same hands under the one boss. According to estimates by economists, this will make it possible to raise labor productivity in transport operations by threefold, to increase feed production based upon the use of food scraps by 2-3 times and, it follows, to obtain the final product -- meat.

What Does a Specialized Vehicle Carry?

During a discussion with competent individuals, it turned out that this was by no means an idle question. And here is why. Let us glance at the plans of the specialized motor vehicle establishment. Rostov, for example, annually furnishes

almost 1 million cubic meters of various types of scraps. A task is established based upon this figure, that is, the removal of garbage generally is planned. Payments are made for this work and bonuses computed. Simply stated, food scraps are treated the same as common garbage in the plans and are not set forth in a separate line. In the final analysis, the collection and delivery of valuable feed components for livestock is a difficult burden borne by the municipal economies. And if an oblast receives a good grade in terms of this indicator, then it derives from the initiative displayed by municipal economy workers and the exactingness required by the deputies of local soviets.

But with each year the work volumes are growing and an increase is taking place in the percentage of food scraps being "collected" at dwellings, at enterprises of the food industry and within the public catering system. The municipal workers made a quite natural recommendation: /to examine the method for planning and delivering the task for collecting and moving "dead-ripe" garbage and valuable food scraps./ The latter return food products to our tables and thus they must be included in the first line of the plan.

In Order To Save Valuable Raw Materials

Laboratory analyses have shown that food scraps are a valuable nutritional raw material for the preparation of complete ration feed for livestock. In accordance with the zootechnical norms, every second ton of meat can be obtained through the use of scraps, with a large quantity of forage grain being saved at the same time.

"To obtain 72 kilograms of food scraps per resident in the oblast" we were informed by the director of the Rostov Institute Academy of Municipal Economy V. Gordeyev-Gavrikov, "is a rather high indicator. However, according to our studies, the limit that is possible is far beyond this figure. For all practical purposes and assuming that the branch has a high level of organization, it is possible for each resident to collect up to 180 kilograms of food scraps annually. Certainly, this indicator will obviously pertain more to our southern city where considerably more vegetables are used for food purposes."

Nobody can dispute the value of utilizing food scraps for livestock feed and thus obtaining additional food products. Nevertheless, even in this very important work there is still a considerable amount of independence and the use of a narrow-minded approach in solving a number of problems. Take, for example, architectural-planning work carried out in the yards of dwellings. Here everything is provided for: children's sandboxes, a place for drying clothes and parking spaces. With the permission of the architects, garages can spring up in the yards in the manner of mushrooms. And yet nowhere was space made available for the collection of food scraps -- such space simply was not planned.

There is still one other important conclusion. All work associated with food scraps should be established on a mutually dependent basis: whoever fattens the animals should transport the already collected feed from the city. Otherwise the municipal workers would agree to take charge of the swine complex and provide the city with finished products.

Summary: The experience of utilizing food scraps, accumulated in cities and workers' settlements throughout the Don River region,

is valuable in the sense that it underscores the tremendous reserves and potential that such use makes available. Today it is already clear: the procurement, transporting and processing of food scraps, in the opinion of specialists, is viewed as an independent branch of the national economy and one having a high level of mechanization. It is a profitable branch and it provides a considerable increase in food products for our tables. True, for the sake of this useful overall endeavor, solutions should be accelerated for the many problems still hindering this important work and making it difficult to obtain all of the economic results that are possible. The leading experience accumulated in the Don River region is confirming this fact.

7026

CSO: 1824/471

LIVESTOCK

FOOD PROGRAM, ANIMAL HUSBANDRY DEVELOPMENT DISCUSSED

Moscow VESTNIK SEL'SKOKHOZYAYSTVENNOY NAUKI in Russian No 8, Aug 81 pp 85-95

[Article by L.K. Ernst of the All-Union Academy of Agricultural Sciences imeni Lenin: "The Food Problem and the Development of Animal Husbandry"]

[Text] The food problem is one of the most acute problems of humanity. The USSR occupies one of the leading places in the world for the calorie level of its food allowance, and already today there is no deficit in our country of many food components. At the same time, the growth of the well-being of the Soviet people and important changes in the conditions of labor have given rise to substantial qualitative changes in the structure of food and the proportion of the most nutritional products of animal husbandry has increased and is continuing to increase. As a result of this, despite the growth of production, the need for these products is not being fully satisfied.

Attributing enormous importance to an increase in the production of animal husbandry products, the General Secretary of the CC CPSU comrade L.I. Brezhnev said from the rostrum of the 26th Party Congress: "The Central Committee of the CPSU is addressing the party organizations of republics, krays, and oblasts, rayon party organizations, and all of the workers of the village with the statement that animal husbandry is today a shock front in the village." In these words is concentrated the will of the party to solve a very important social and economic problem--an increase in the production of animal husbandry products.

Today the greatest bottleneck in the production of animal husbandry output is feeds and, in general, the entire complex of animal feeding. A sharp increase in the production of feeds has become a top-priority task. Calculations based on research and on a generalization of advanced domestic and foreign experience have shown that in order to obtain the animal husbandry output planned for 1985 it will be necessary to bring the productions of feeds to 493.3 million tons of feed units. This is the minimum growth rate.

But the problem is not only of increasing the amount of feeds. A number of disproportions have arisen in the process of the development of animal husbandry and feed production: between the growth rates of the animal herds and the production of feeds, between the amount of nutritional substances being produced and protein, between the total production of protein and rich albumin, grain and volume feeds, grain and fodder and also pea crops, and between the amount of feeds which is procured and feed storage capacities.

All of these disproportions can be summarized as an essential lack of correspondence between the already created quite high genetic productivity potential of the most widespread breeds of animals and the conditions for its realization. Especially substantial discrepancies have arisen in the feeding of chewing animals where the deficit of coarse and succulent feeds has resulted in a chronic overexpenditure of grain, giving rise to a number of negative phenomena both in the biology of the animals and in the economics of the cattle and sheep raising branches. Calculations have shown that by 1985 it is essential to increase hay procurements by a minimum of 31.4 percent and to improve its quality, while at the same time sharply increasing the production of other coarse and succulent feeds. In this connection, the development of a system of feeding chewing animals which is aimed at economizing grain is important. It is essential to accelerate the introduction of moderate concentrate rations which have already been developed by science and to actively improve the low concentrate system of feeding chewing animals which realizes in the most rational manner their potentialities as the sole transformers of coarse feed into food products.

Closely connected with an improvement of the feed balance is the full exploitation and an increase in the productivity of natural lands which occupy more than 320 million hectares in the country. To date clearly insufficient attention is being devoted to this important matter. The greatest reserves in the production of feeds are precisely in the use of the resources of natural lands. Scientific institutions have developed and conducted practical tests on technologies for their superficial and fundamental improvement, which yield 4,000-5,000 feed units per hectare, and, with irrigation, 12,000-15,000. However, the new technologies are being introduced slowly, since the notion is still dominant that it is less effective to invest in natural lands than in arable land. Yet, the research of Soviet and foreign scientists and a generalization of production experience shows without doubt that the production of output per unit of resources (capital, labor, energy) which are invested in improving natural lands is very high. In the opinion of leading researchers, the introduction of technologies for improving natural lands could increase the production of feeds for ruminants by several times.

In the light of the task posed by the Communist Party at the 26th CPSU Congress of sharply increasing the production of feeds, including coarse and succulent feeds, it is necessary to develop and to carry out during the forthcoming decade a special-purpose state program for the intensification of feed production on natural lands, allocating the necessary resources for this. This will yield a rapid return. Research on improving natural lands with minimum expenditures of resources and labor has to be included in this program.

The prevention of losses of feeds during harvesting and storage is a very acute problem for the present and for the future. Scientific institutions have proposed a number of effective preservatives, but, unfortunately, their production by the chemical industry is developing slowly. During the 11th Five-Year Plan research will be expanded and carried out in contact with scientists from the USSR Academy of Sciences and other departments. A difficult task has been set--to find the most effective, harmless for animals, and, most important, cheap preservatives.

Money and efforts should not be spared for this search, since the solutions which are obtained will help to preserve 20-25 percent of the nutritional substances produced.

Another cardinal problem consists of increasing the transformation of nutritional substances into animal husbandry products. It is generally known that the efficiency coefficient of animals as a whole is low and depends upon many factors, including an increase in the digestibility of nutritional substances and an improvement of the nutritional value of harvested feeds, which is achieved by processing them. Scientific institutions have provided a number of methods of processing feeds, but many of them, while they increase the digestibility of feed, only increase its nutritional value negligibly. Yet, large amounts of resources are being invested in the construction of feed shops and in their operation.

World tendencies in research on feed technology show that the center of gravity is shifting toward a deeper processing of feeds, the breakdown of the lignin-cellulose complex, and the hydrolysis of complex carbohydrates. These methods sharply increase the nutritional value of straw and other cropping waste products and of wood waste products, and the deficit of easily fermentable carbohydrates is thereby eliminated. It is not superfluous to recall that it is precisely cellulose which represents around 70 percent of the organic matter which is possessed by cropping, not counting the enormous amount of waste products in the timber and timber processing industry which we are only just beginning to use in the feeding of animals. In the USSR a research program has been begun in this direction, but in a number of countries (the United States, Canada, Sweden) much more attention is given to this problem and substantial resources are being expended on it.

The serious disproportion between the overall level of animal feeding and the level of protein has become one of the chief reasons for low productivity and for a serious overexpenditure of grain in animal husbandry. The shortage of feed protein is being felt especially sharply in swine breeding. The problem of feed protein has two aspects: the production of ordinary and of rich protein. The overall shortage of protein could be eliminated by a sharp increase in the production of feeds made from pulses and pea crops, and this must be done without delay. It is more difficult to increase the production of rich protein which is represented basically by proteins of animal origin. It is generally known that without a definite amount of them in rations the development of the most important early maturing branches is held up--poultry and swine breeding, and also fur animal breeding. One cannot count on an increase in the traditional sources of animal protein now or in the future since they are needed for human food. A large role in the solution of the problem has to be played by an accelerated development of microbiological productions of protein and irreplaceable amino acids.

The search for sources of animal protein in the products of the sea is promising. However, there is still much that is unclear here, especially from the point of view of economics, and, for this reason, the overall efforts of the All-Union Academy of Agricultural Sciences imeni Lenin, the USSR Academy of Sciences, and other departments have to be directed toward a search for fundamentally new ways of producing rich protein.

A deficiency in rations of easily digestible carbohydrates is seriously holding back the growth of the production of animal husbandry products, especially in cattle breeding. The efforts of a number of scientific institutions will be directed toward a search for ways to eliminate it. Research is continuing on vitamin and mineral nutrition for animals and on a number of other important problems. An increase in the productivity of livestock combined with a more rational expenditure of grain is connected with an improvement of the technologies for producing combined feeds. It is essential to create mixtures which correspond most fully to the needs of highly productive livestock and which include a substantial amount of non-grain components. A study of the influence of physical factors upon the quality of combined feeds is of great interest. During the five-year plan which is now begun this problem will be studied on a broad front.

Present-day knowledge of the needs of animals for nutritional matter and of the influence of maintenance and use on productivity, and current methods of evaluating their genetic potential are creating a good basis for working out a system of animal productivity programing. And this is becoming a top-priority task.

Soviet zootechnical science occupies advanced positions for a large number of directions in nutritional research for agricultural animals. Methods of studying digestive processes with the help of fistulas which have been developed by Soviet scientists have gone into the treasure house of world science. Basic research has been performed in our country on revealing the nutritional value of feeds, and this has placed the planning of animal feeding on a scientific basis. Nevertheless, for certain problems the amount of research will have to be expanded.

An analysis of world tendencies shows that in recent years there has been a sharply increased interest in studying digestion, especially gastric digestion, in ruminant animals where an enormous role is played by microorganisms. It has become clear that an optimization of the microbiological processes in the rumen of ruminants is a decisive condition for increasing the effectiveness of the transformation of feed into animal husbandry products. Research has established the possibility of activating the microbiological processes, primarily those connected with a fuller fermentation of complex carbohydrates, and, chiefly, cellulose which comprises the basis of the organic matter of coarse and succulent feeds. In discussing this problem it should be noted that in our country it is being solved with insufficient resources, that in the All-Union Scientific Research Institute of Animal Husbandry and in the All-Union Scientific Research Institute of the Physiology and Biochemistry of Farm Animals only individual experiments are being conducted which are not tied together in a single program. Meanwhile, research which has been undertaken by the All-Union Scientific Research Institute of Agricultural Microbiology jointly with a number of zootechnical institutions has shown that this problem is of enormous national economic importance. For this reason, an optimization of the microbiological processes in the rumen of ruminants and methods of increasing the effectiveness of their digestion has to be assigned a special place in the scientific programs of the 11th Five-Year Plan. It is necessary to work out and realize a special-purpose program and to enlist specialists on feeding, physiology, and microbiology. The All-Union Scientific Research Institute of the Physiology and Biochemistry of Farm Animals should become the coordinator. All of this will make it possible to find and introduce methods for increasing the efficiency coefficient of ruminants.

Research on this topic is also directly related to the search for the most effective preservatives which, while suppressing undesirable microflora during the storage of feeds, will not violate the microbiology processes of the rumen. A study of the physiology and microbiology of the rumens of ruminants will make it possible to preserve the protein of feeds while they are passing through the rumens. In a number of countries protein protectors have already been proposed which permits a more economical use of it in the feeding of cattle and sheep. Solutions to these questions in our institutes will be a substantial contribution to the solution of the problem of feed protein. This problem is so important that it must be worked upon in a purposeful way and with substantial resources.

To a certain extent lagging has also arisen in the development of a modern energy system for feed nutrition evaluation. During the current five-year plan this problem has to be concluded, and the results introduced into the practice of feeding.

In the entire world, along with the development of the traditional directions of feed production, an intensive search for new sources is taking place. The goal is being set of making the fullest use of all types of organic matter as sources of animal nutrition. New technologies are being sought for processing all of the waste products of cropping which are not included in human nutrition. There is a global task--to make cropping waste-free and, for this purpose, to enclose it in a single cycle with animal husbandry. Enormous masses of the most valuable organic matter are being irretrievably lost. This applies first of all to the masses of organic matter which are formed in the procurement and processing of timber. Intensive research is being done in the entire world (the United States, Canada, Sweden, the Czechoslovakian Socialist Republic, and others) on the possibility of converting wood wastes into nourishing feeds. Through the methods of partial and full hydrolysis and other processing methods including physical, chemical, and microbiological methods, a whole range of feeds have already been obtained on the basis of processing wood; a large number of commercial enterprises for their production are in operation abroad. Our country occupies first place in the world for its stocks of wood and for its wood production. The total amount of waste products during wood processing is approaching 100 million cubic meters. But only a negligible part of this enormous wealth is directed toward the direction of feed yeasts. Yet, research which has been conducted in very recent years (the laboratory of feed resources from timber, and a number of scientific research institutes with a zootechnical specialization) has revealed enormous prospects for turning wood waste into feeds. The production of a number of feeds, particularly wood molasses, has gone through the stage of plant tests, the production of molasses made of top peat has been organized, and a partial hydrolysis technology for obtaining sugared coarse feeds from wood has been tested. At the same time, research on this topic is still lagging with respect to volume and necessary level.

Technologies which have already justified themselves are being introduced slowly. During the present five-year plan it is necessary to intensify this kind of research and to begin the wider introduction of technologies which already have been created. This will bring new reserves into feed resources, which is especially necessary in the north and east of the country. Of course, the direction which has become

marked out is completely new, developed cadres are lacking here, and a definite psychological barrier which usually arises when fundamentally new directions are born in science is making itself felt. Nevertheless, it has become absolutely obvious that the problem has to be solved at accelerated rates--it is of enormous national economic importance. Its development is connected with another very important aspect of animal feeding--the enrichment of rations with easily digestible carbohydrates. Their deficiency in cattle rations is quite significant, especially during the winter period. The conversion of cellulose into sugar will greatly decrease this deficit.

The organization of the production of wood molasses and its enrichment with non-protein nitrous compounds will also reduce the deficit of protein in the feeding of cattle. There is a large number of other problems whose solution will rationalize these processes and make it possible to expend feed for the production of output more economically.

Scientists in the field of animal nutrition have to concentrate their efforts on more promising directions which are capable of substantially increasing the level of feeding, balancing rations, and increasing the coefficient of the transformation of feeds into animal husbandry output.

On the whole, our country has a definite scientific stock and all of the objective conditions exist for the rapid elimination of the disproportions which have arisen and for providing for animal husbandry's needs for rich feeds, which will make it possible to make full use of the genetic potential of animal productivity and to sharply increase the production of animal husbandry products.

The second component of an accelerated development of animal husbandry is a qualitative improvement of the animals. These problems have traditionally been solved by zootechnical science. The result has been the creation of highly productive domestic breeds of farm animals and the improvement of existing breeds. At the same time, in the process of the intensification and industrialization of animal husbandry new difficult problems have arisen. A lack of correspondence has appeared between the quality of the animals and the conditions of the new technological environment, which has a negative influence upon the introduction of industrial production technologies, reducing their efficiency. The task of creating types of animals which combine a high genetic productivity potential and the capacity to realize it under the conditions of industrial technologies stands before us in full height. The creation of selection methods and programs which take account of this new situation has begun. During the 11th Five-Year Plan this work will be continued and its introduction into the practice of breeding will become the chief element. The rates of the qualitative improvement of animals on the basis of traditional selection methods are not rapid: for example, a minimum of 25-30 years was demanded for the creation of a cattle breed. This was the reason for the slow rates of the introduction of selection achievements into animal husbandry.

Today the situation in the USSR and in the entire world has changed radically. And the world's animal husbandry is obliged for these huge changes to the very important discoveries of Soviet scientists who gave the world methods of artificial insemination and of the prolonged storage of the semen of producers. On this

basis and in synthesis with the latest modern methods of analyzing genetic information with the use of computers a system was created for large-scale selection which greatly accelerates the rates of the genetic improvement of animals. To illustrate, I will cite only one example. The possibility for the flexible maneuvering of genetic resources in the form of deep frozen semen has accelerated the qualitative improvement of existing breeds, and during the last ten years alone the proportion of pure bred cattle in the USSR has increased by 3.5 times. This became possible only through the use of large-scale selection. In addition, the accumulation of genetic reserves has created the most favorable conditions for the development and rapid multiplication of new breeds, types, and lines of animals. During the 10th Five-Year Plan 6 breeds, 13 types, and 83 new lines of farm animals with high productivity indicators was created. For the forthcoming decade zootechnical scientific institutions have been given a difficult task--to create 14 new breeds, 38 types, and more than 100 lines of animals. Already today programs are being actively formed for the creation of new breeds of dairy cattle with a yield of 5,000-5,500 kilograms and more which are adapted to present-day technology; and for the creation of highly productive breeds of specialized meat cattle, meat and bacon type swine, sheep, and poultry. Creative collectives have been created which include researchers, selection center workers, and practical breeding workers. Recently it has become increasingly obvious that it is necessary to begin work not only on improving existing animal breeds, but also on creating new highly productive ones which are fully adapted to exploitation under industrial technology. Eight selection programs for developing new breeds are being formed through the overall efforts of a number of institutes: four dairy and one meat breed of cattle, one breed of swine, and two breeds of sheep. The latest methods of large-scale selection will be used here. All of this will make it possible not only to solve selection problems, but also to rapidly introduce results into animal husbandry practice. The efforts of zootechnical scientific institutions with a selection specialty have to be directed toward this end.

The creation of types and lines which are resistant to specific diseases is a program task of present-day animal selection. Soviet scientists who have been working on the development of farm animals have in recent years conducted research which has established a number of regularities connected with the genetic resistance of animals to a number of diseases, particularly leucosis. Selection programs have been created which provide, in addition to selection for greater productivity, for the creation of animal populations with increased resistance. This kind of program is functioning in the Latvian SSR. At the same time, this new task is very difficult and it contains many unresolved elements, while its national economic importance is enormous. In this connection, the scientific forces which have been gathered in this direction cannot be acknowledged as sufficient. It is essential to substantially strengthen this direction and to bring about an efficient interaction between zootechnical and veterinarian researchers. The problem of animal resistance is very acute and it has to be solved by concentrating forces and resources.

Mathematical modeling is acquiring increasing importance in animal selection. Work on modeling selection with computers is being performed in the All-Union Scientific Research of Animal Husbandry, the VNIIRGZh [expansion unknown], and other scientific institutions. A system of managing breeding work with the help of the

"SELEKS" computer has been created and is being successfully introduced. However, this research has to be substantially expanded and introduced more fully into breeding practice. Today, when a network of animal husbandry selection centers which are closely connected with breeding researchers and practical workers has been organized, all of the conditions exist for a sharp acceleration of the introduction of genetic achievements into animal husbandry practice.

An optimization of breed regionalizing, which is especially important for our country with its many zones and many breeds, is very important in increasing the effectiveness of the branch. Quite substantial differences have become established in the genetic productivity potential of the breeds which are raised in our country and this has led to the fact that the numbers of some have begun to increase at accelerated rates, the areal of others to decrease, while the numbers of certain breeds have been reduced to a critical level.

These processes have an objective character, and the dissemination of more productive breeds is being dictated by the operation of economic factors. At the same time, a certain anarchy and subjectivism and insufficient substantiation in the redistribution of breeds are manifesting themselves. This has been leading to the fact that animals have been brought into certain zones of the country of breeds which under the given natural and climatic conditions are unable to fully manifest their genetic potential and are subject to diseases. In other zones which are favorable for the development of any breeds an unjustified multiplicity of breeds has been taking shape and, along with highly productive breeds, others are being raised with a substantially smaller productivity potential. Scientific institutions possess sufficient and ever increasing information about the productivity qualities of animals and about their adaptability to different natural and climatic conditions. However, this information is scattered over many scientific publications and, for this reason, cannot be used effectively. It is absolutely essential to bring all of this information together and to perform corrections on the breed regionalization plan which has not been changed for a long time now and does not correspond to current requirements. This is extremely important for the practice of animal husbandry, and the All-Union Scientific Research Institute of Animal Husbandry in cooperation with republic and zonal institutes should optimize the breed regionalization plan. This will be a serious contribution to increasing the effectiveness of animal husbandry. A no less important economic-zootechnical problem is to optimize the combination of the different branches of animal husbandry both in the country as a whole and by regions. The combination of animal husbandry branches has to be based on a precise calculation of many factors the chief one of which is the potentialities of combined feed production. The relationship between animal husbandry branches in a number of zones is formed without sufficient scientific substantiation, which leads to a decrease in productivity and to the necessity for the redistribution of large amounts of feeds. Insufficiently full research leads to a number of negative tendencies. Among them, for example, is the curtailing of sheep breeding in a number of regions of the country, including in the non-chernozem zone. Moreover, the curtailment of this branch is accompanied by a deterioration of the use of natural feed lands.

In a word, the problem of an optimal combination of animal branches is of enormous national economic importance. Scientific institutions have to give exact

recommendations to production about the optimal relationship of branches for each of the country's natural and economic zones. The population density of farm animals in areas which are close to one another in natural, climatic, and economic conditions shows sharp differences. This also testifies to an insufficient substantiation of the planning of the basic development indicators of animal husbandry. Zootechnical and economic scientific institutions have to do active work in solving this problem in order to equip planning agencies with precise norms for scientifically substantiated planning. All of these problems have to be solved during the course of the 11th Five-Year Plan and this will accelerate the development of animal husbandry and increase its effectiveness.

At the same time, there are a number of fundamentally new directions in zootechnics which are opening up new prospects in animal selection. This is research work which is connected with cytogenetic engineering, the regulation of gametogenesis and fertilization, control over embryogenesis, an improvement of transplantation methods, and a search for methods for genetic copying in animals. This work is now being conducted in close contact with the USSR Academy of Sciences within the framework of the special-purpose "Embryogenetics" program. A definite stock has already been created in our country and it has to be developed with all means. This is a priority for our science and, most important, the prospect of a fundamental improvement of selection and breeding.

A bottleneck in animal husbandry is the low level of reproduction of animals which sharply reduces the effectiveness of the entire branch. It is necessary to substantially expand the research front for the entire complex of problems. This concerns an improvement of the methods of artificial insemination and, in particular, more active efforts have to be made in improving the methods for the long-term storage of sheep sperm; it is necessary to activate a study of the hormonal stimulation of the reproduction functions, of early pregnancy diagnosis, and of the processes of embryogenesis, especially its early stages. The creation of overall and reliable systems for regulating and optimizing reproduction processes has to be accompanied by their rapid introduction into production.

A highly important direction of research for the forthcoming period includes an improvement of the existing and the introduction of new effective technologies for the production of the basic animal husbandry products which ensure an increase in animal productivity combined with a substantial decrease in expenditures of labor and feeds per unit of output. Our scientific stock of knowledge and an analysis of advanced experience permits us to count on the creation and wide introduction of technologies for the production of milk with per quintal labor expenditures of .8-1 man-hours, beef--2.5-3 man-hours, pork--1.5-2, poultry meat--1 man-hour, and 1,000 eggs--.6 -.7 man-hours.

The operation of dairy complexes and large mechanized farms has revealed a discrepancy between the needs of animals for feed and the development of the feed base and between the requirements of technology and the quality of the animals. The cost of housing is still high and the reliability of mechanization systems is low. All of these phenomena have to be subjected to a careful analysis in order to make the necessary corrections in the existing plans and the ones being newly

created. It is necessary to strengthen the developer's supervision over the construction and commissioning of animal husbandry complexes. In developing new technologies especial attention should be directed toward decreasing the specific cost of production and using cheaper materials, including wood.

In the field of the mechanization of the branch a course has to be taken aimed at the creation of implements of production which ensure a sparing regimen for the animals and take account of their physiological needs. The reliability of mechanization equipment upon which the effectiveness of the introduction of technologies largely depends has to be substantially increased. An important direction which creates a mass dissemination of industrial technologies combined with an economy of expenditures is the modernization and reconstruction of the livestock farms. A number of reconstruction plans have been created, but the needs of production demand greater scope for this work since connected with it are the introduction rates of new technologies and the efficient use of already existing capital.

The flow line-shop system of cattle maintenance which is being widely introduced in the country requires further improvement: it is necessary for rapidly transferring dairy cattle raising to industrial technologies and it helps to increase productivity and reproduction with a more rational expenditure of feeds.

Technological tasks can only be successfully accomplished with the organization of research and planning development work and with introduction in accordance with the special-purpose principle. In addition, there has to be overall research on the most diverse objects which are the subject of study both of zootechnics and of a number of biological and technical sciences. In no other problem is there such an unquestionable necessity for the meeting of various sciences as in the development of new technologies. A certain amount of experience in forming such research was gained during the past five-year plan, but it has to be improved organizationally.

The special-purpose overall scientific and technical program "Increase the Production of Animal Husbandry Products on an Industrial Basis" has come into effect. Its most important characteristic is an overall solution of all aspects of the production of specific animal husbandry products: selection, feeding, mechanization, economics and labor organization. This kind of integration makes it possible to produce overall solutions.

Another important aspect of the program is its coverage of all stages: research, development work, planning, construction, and the testing of experimental technology objects. In connection with this, the program's executors includes research institutes of various profiles, higher educational institutions, planning and designing organizations, and producer plants. All of this creates conditions not only for fruitful work, but also for the rapid introduction of scientific achievements into production.

The applied problems of animal husbandry are being studied in our country under the most favorable conditions. A farflung network of head, republic and zonal animal husbandry institutes is in operation. In all of the zonal agricultural

institutes and experimental stations there are animal husbandry subdivisions, and a large detachment of veterinary researchers is working in our higher educational institutions. Of course, this network has to be expanded. However, the chief task now is to substantially increase the effectiveness of already operating scientific collectives. Meanwhile, the workload on scientific workers is very uneven. Sometimes in planning research the kind of situation is created in which a substantial number of scientific workers do not work to the full measure of their potentialities. This also applies to entire scientific collectives. All of this is connected with a weak development of methodologies of research planning. Institutes which differ two to three times with regard to the number of their associates and their available capital receive programs of approximately identical size and complexity with the result that some work at half strength, while others do not produce sufficiently high quality scientific output. In correcting research plans the scientific programs of institutes have to be brought into correspondence with their real possibilities.

The structure of the institutes also requires improvement. Certain negative tendencies are showing up here also, in particular, an increasing breaking up of collectives into small subdivisions. First of all, this makes the management of research more difficult and, secondly, it leads to the production of incomplete scientific output which is unsuitable for direct introduction into production. It is necessary to create larger scientific subdivisions which are directed toward the solution of specific problems and are capable of developing integrated technologies. These subdivisions have to include scientists of various profiles, including planning specialists, and this will accelerate the introduction of scientific ideas into production.

A radical improvement of the coordination of research also contains large reserves. At present coordination operates only at the stages of planning and summing up results; in other words, as the initial and final stages of research. The research process itself, however, is carried out by different scientific collectives in isolation from one another. But experience shows that the greatest effect is achieved when experiments are carried out jointly. Brought together into close creative collectives, scientists with different specialties make joint use of the equipment and instruments of several institutes. In contrast to this, the isolation of the collectives of different institutes reduces the overall effect, which causes great damage to science. In this connection, it is necessary to initiate a large number of overall projects on the basis of the cooperation of institutes and their active collective participation at all stages of research. This will undoubtedly raise the scientific and methodological level of research and speed up the rates for accomplishing the most difficult research tasks.

An indispensable condition for the effective functioning of a scientific collective is the generation of new ideas, the creation of new information, and the production of scientific output which has no analogs; that is, which is characterized by absolute novelty. Under today's conditions, when agricultural research is being performed on a wide scale in the entire world, the problem of the selection of directions and topics is an acute one. This has to be preceded by a study of everything that has been done in a given field of knowledge and by a patent search

which will exclude the repetition of what is known. This kind of work is still being performed inadequately in most zootechnical institutes, and frequently resources and efforts are expended for the repetition of already solved problems. These are direct and irreparable losses.

In order to increase the effectiveness of scientific work a patent-license service has to be organized in the near future in institutes, and information institutes have to improve their information services for scientific collectives. All this will produce a rapid effect. The All-Union Scientific Research and Technological Institute of Poultry Breeding where patent-license work has become a component part of the organization of research work may serve as an example.

Introduction into production is the crown of any applied research. Here there will have to be a large amount of strenuous work and the reevaluation of many values which have become customary. Let us begin with the fact that the developed practice of evaluating a scientific worker basically by the number of his publications does not help to enlist researchers into introduction work. The prestige of the work connected with introduction itself has to be increased and a system of moral and material incentives for scientific workers for successes in production work has to be developed. It is also necessary to strengthen introduction subdivisions which are still poorly developed in most zootechnical institutes. The organization of scientific production associations has to be begun on the basis of a number of zootechnical institutes. Most zootechnical institutes already have several experimental farms. Their production base has to be further developed and scientific production associations have to be formed on this basis in order to join science and production more closely together.

And, finally, the scientific output itself which is produced by institutes has to be complete and verified in production conditions, and the results achieved in an experiment have to be reproduced exactly under the conditions of the farms. It goes without saying that introduction will be successful if production workers also worked actively in this direction. Only close contact between scientific and production workers can accelerate scientific and technological progress in animal husbandry.

The 26th CPSU Congress has set new large and difficult tasks for the country's animal husbandry workers. There has to be a sharp increase in the production of animal husbandry products and an improvement of their quality. Our overall success will depend to a large extent upon how and with what scientists will arm the branch's workers and upon how rapidly research results are brought to the sphere of production. The collectives of our zootechnical scientific research institutes, selection centers, and experimental farms will make every effort to carry out the tasks posed by the 26th CPSU Congress.

COPYRIGHT: Izdatel'stvo "Kolos," "Vestnik sel'skokhozyaystvennoy nauki," 1981

2959

CSO: 1824/476

LIVESTOCK

CALCULATION OF LIVE WEIGHT IN DELIVERY OF LIVESTOCK URGED

Moscow ZAKUPKI SEL'SKOKHOZYAYSTVENNYKH PRODUKTOV in Russian No 7, Jul 81, pp 33-35

[Article by A. Mysheleva, candidate of economic sciences and head of a sector at the Belorussian Scientific Research Institute of Economics and Agricultural Organization: "Calculation of Live Weight Upon Delivery of Livestock"]

[Text] In the December issue of our journal for 1979, an article was published by specialists attached to the All-Union Scientific Research Institute of the Meat Industry entitled "Planning Based Upon Final Results." In it, the authors submitted recommendations for improving the planning of livestock procurements, animals accepted on the basis of the weight and quality of their meat. Today we are publishing still another article in which the author proposes an improvement in this method of sales. The article is published in the form of a discussion.

A most important direction to be followed for further improving the efficiency of public production, under the conditions imposed by agroindustrial integration, is that of uniting the economic interests of enterprises in related branches and orienting them towards the final results. In solving this problem, great importance is being attached within the branch to converting over to accepting livestock from the kolkhozes and sovkhoses based upon the weight and quality of the meat obtained during the slaughtering of the animals. A single indicator for measuring the quantity and quality of the raw materials procured in agricultural production and the products of their initial processing in industry promotes a drawing together of the interests of these branches. Thus we are speaking mainly here about the final product, the product that proceeds directly into the consumption stage.

The extensive use, for a period of more than 10 years, of this method of computations for livestock sold by agricultural enterprises allows us to conduct a comprehensive evaluation of it. The method makes it possible to determine in a more objective manner the quantity and quality of the product for which the computations are being carried out, it raises the interest of the farms in raising and selling livestock having higher meat yields and it is directed towards improving the organization of animal fattening operations, the preparations for delivery, transport operations and pre-slaughtering maintenance and processing.

However, despite the progress achieved in the use of this method for evaluating livestock sold and its computations based upon meat yield, criticism continues to

be heard and especially from agricultural specialists. At times, recommendations are made with regard to the need for returning to the former conditions for computations based upon live weight. The complaints concern mainly a certain amount of lack of responsibility for the livestock during shipment from the farms to the meat combines, particularly under the conditions imposed by Tsentrovvoz, violation of the principle of acceptance at the sites, which presupposes determination on the farms of all of the indicators required for formulation of the receipt, holding the livestock too long at the pre-slaughtering bases, violations of the processing technology and insufficient control by the agricultural representatives over the correct determination of the meat quality. In the final analysis, all of this results from weak interest on the part of the processing enterprises in protecting the primary raw materials during all of these stages and in connection with the computations for the meat yield obtained from these materials.

It should be recognized that such an opinion results not only from failure to properly evaluate the new method; there are also other definite reasons. For example, according to the accounting data of specialists responsible for controlling observance of the rules for the delivery, acceptance and processing of livestock and poultry at enterprises of the meat industry of the BSSR, during January and February of 1980 alone various types of sanctions amounting to 159,000 rubles were imposed against meat combines, of which amount 114,000 rubles have been paid.

An analysis of the reasons for imposing such sanctions reveals that they were mainly associated with holding the livestock over for too long a period at the pre-slaughtering bases of the processing enterprises (39 percent), violations of the processing technology (17 percent), mixing up of the groups of livestock from various farms (20 percent), vexing problems associated with determining the state of nourishment of the livestock (6 percent) and so forth.

A great amount of criticism derives from shortcomings of a particular nature in the marketing conveyor line. At some processing enterprises, the unloading areas are poorly equipped and, as a result, the animals sustain injuries. Watering places are not organized and quite often the farms do not adhere to the delivery schedules and they tolerate the shipping of livestock that do not have ear tags or are overfed and also violations in the preparation of the accompanying documents. At times the livestock sustain injuries while being transported. All of these factors tend to result in quantitative and qualitative losses in meat output.

At the same time, the reasons for the mentioned and other shortcomings in the organization of livestock procurements and processing should not be associated with the use of calculations for them based upon meat yield. These shortcomings took place earlier and with the conversion over to the new method for accepting livestock, their consequences began to appear to a greater degree at the interbranch level, since a change had taken place in the attitude of the kolkhozes and sovkhoses towards the final product. Whereas when livestock calculations were carried out according to live weight the losses in meat output during all stages of its movement from delivery to slaughtering did not infringe directly upon the interests of the farms, at the present time the economic results of their work, similar to the processing enterprises, are directly dependent upon the meat yield.

Thus, rather than departmental arguments concerning the advantages of the former or existing method for evaluating livestock, the foundation for improving the

preservation of meat products must be that of joint efforts directed towards realizing the advantages embodied in the new method. An increase in the effectiveness of introducing livestock calculations according to the quantity and quality of meat requires further improvements in the organization of the entire transport-marketing and processing conveyer line.

First of all, it will be necessary, to the degree that it is possible to do so, to achieve uniformity in livestock deliveries throughout the year. At the present time, such uniformity is not being realized owing to a number of objective and subjective reasons. Fluctuations in the arrival of the animals tend to complicate the work regime of the processing enterprises and they also affect the efficiency of use of specialized transport vehicles.

An analysis of the seasonal nature of livestock procurements at kolkhozes and sovkhoses in the BSSR, by periods during 1978-1980, reveals that the monthly sales vary from 5 to 13 percent compared to the annual deliveries. The minimal livestock procurement volume in April and the maximum in September differ by a factor of 2.6, including for swine -- 2.2 and for large-horned cattle -- a factor of 2.7. Even greater irregularities in livestock deliveries are noted in individual oblasts and raw material zones of the processing enterprises.

The fluctuations in the deliveries of large-horned cattle to the processing enterprises, as is well known, are predetermined by the fact that the offspring are obtained at certain times of the year. However, the organization of the raising and fattening of livestock is making it possible to arrange more uniform livestock deliveries. The structure for fattening large-horned cattle, according to various weight conditions, does not differ substantially throughout the year. Thus, the proportions for animals of different weights, compared to the overall number undergoing a fattening regime, were as follows for certain months in 1978-1979 (in percentages):

	До 150 кг (1)	151—250 кг	251—350 кг	Свыше 350 кг (2)
Январь (3)	4,2	35,3	42,0	18,5
Март (4)	4,6	36,7	44,4	14,3
Июнь (5)	4,5	31,4	45,7	18,4
Сентябрь (6)	3,8	29,2	46,9	20,1
Ноябрь (7)	3,7	20,4	46,8	19,1

Key:

- | | |
|---------------------|--------------|
| 1. Up to 150 kg | 5. June |
| 2. More than 350 kg | 6. September |
| 3. January | 7. November |
| 4. March | |

Taking into account the more uniform monthly arrival of swine offspring throughout the year (from 7 to 11 percent) and their fattening, a corresponding rhythm can be expected in the delivery of swine for processing. This factor will also have an equalizing effect on the seasonal nature of livestock procurements on the whole. However, in actual practice the delivery of swine is by no means uniform. Hence

the fluctuations in the arrival of livestock at industrial enterprises are caused not only by objective factors but also by shortcomings of an organizational nature.

More than 40 percent of the livestock are procured during the last months of the fiscal quarters and less than 60 percent -- during a period that is two times longer. Such a disproportion in sales is encountered even at large fattening farms, which in accordance with their production conditions are capable of ensuring uniform sales.

Excessive workloads for the processing enterprises during the last months, 10-day periods and even days of an expired quarter result in the livestock being retained too long at the pre-slaughtering bases, in intensive transport operations and so forth. Fluctuations in deliveries is one of the chief factors hindering further development of centralized transporting of livestock, which up until now has remained at the 1975 level throughout the republic, that is, 60 percent of the overall volume of procurements. In order to avoid peak livestock delivery volumes at the end of each quarter, strict control is required over the fulfillment not only of the quarterly, semi-annual and annual procurement plans but mainly of the monthly plans. A disruption in livestock deliveries during individual months must be taken into account when evaluating the work of farms and awarding bonuses to their workers, regardless of the level of fulfillment of the annual procurement plan on the whole. In addition to regulating the livestock delivery schedules, a requirement also exists for simultaneously strengthening contractual discipline.

In the interest of improving the organization of livestock procurements, the size of one-time groups of animals should ideally be established on a sound basis and strict priorities assigned for deliveries by each farm. This will predetermine the daily number of suppliers for a processing enterprise.

Observations carried out on livestock deliveries in September at the Baranovich Meat Combine, a low capability enterprise, revealed that the daily number of supplier-farms amounted to a monthly average of 25, with fluctuations on some days ranging from 11 to 50. The average weight of one-time groups of large-horned cattle was 8 tons and swine -- 6 tons, with a shift capability at the meat combine of 38 tons of meat. Moreover, livestock deliveries in small groups of animals are considerable when viewed over the course of a year's time.

While the existing instruction on the system of livestock acceptance by meat combines and the calculations for livestock accepted according to the weight and quality of the meat calls for the livestock to be turned over in groups of no less than 30 head, the proportion of such groups, as established by the Baranovich Meat Combine example, still occupies only approximately two thirds. Livestock deliveries in small groups predominate at farms having relatively small livestock procurement volumes: up to 100 tons -- 73 percent, 101-200 tons -- 44, 201-300 tons -- 37 percent and so forth.

At the same time, the sound formation of the size of single groups of livestock deliveries by each farm is largely dependent upon the priority established for delivering the livestock. By no means is it correct for a farm to supply livestock on the average of four times monthly, with the fluctuations between months ranging from two to 12.

The daily presence at meat combines of numerous suppliers having small groups of livestock adversely affects the accuracy of the delivery-acceptance operations and it engenders various conflicts between the farms and enterprises. First of all, complications arise in the processing of the livestock and in making a determination at the slaughtering line as to which farms the animals belong to, especially if the ear tags have been lost. Difficulties are also encountered in composing and observing the daily and hourly schedules for livestock deliveries and a reduction takes place in the efficiency of use of specialized transport vehicles.

As animal husbandry converts over to an industrial basis, real prerequisites are being created for observing sound priorities and for enlarging the single groups of livestock deliveries. However, the solving of these problems is possible only under conventional farm conditions. This would require the assembling of a livestock group upon delivery for fattening, during the fattening process or upon removal from it, while adhering very strictly to definite intervals between the animal delivery periods. The animal groups to be fattened must be formed in a manner such that prior to the final fattening cycle a large group of animals having almost the identical weight and nutritional value is obtained.

Calculations on justifying the priorities for deliveries from different size farms reveals that on farms having an annual procurement volume for large-horned cattle of up to 1,000 head, the deliveries should be carried out no more than once, for more than 1,000 head -- twice monthly; with an annual procurement volume for swine of up to 12,000 head-- once, 12,000-24,000 head -- twice and 54,000-108,000 head -- four times monthly. The observance of the recommended periodicity for livestock deliveries during the year, especially on small farms, will make it possible to increase considerably the size of the single groups of animals and to bring them closer to the requirements of the meat combines and transport organizations.

At the same time, the organization of more rhythmic livestock deliveries requires the sound development and strict observance of schedules, mainly hourly schedules.

When preparing an hourly schedule, many indicators must be taken into account: the daily capability of the processing enterprise, the number of suppliers, the sizes of the single groups of animals, the priorities for livestock deliveries by each farm, the delivery schedules, the structure of the transport vehicles employed in terms of their load carrying capabilities, with a correction for their coefficient of use, the number of trips made by one vehicle and the time for the acceptance and processing of each group of livestock.

The hourly schedules developed at the present time using the "manual method" by no means take into account all of the factors and thus they do not have adequate force. They are violated frequently and it is impossible to impose sanctions upon the violators. The optimization of an hourly schedule for livestock deliveries, taking into account all of the information required, is achieved when it is developed with the aid of an electronic computer and based upon a solution for the transport task and also the schedule for network planning.

In addition to solving the mentioned organizational problems associated with livestock procurements, greater mutual economic interest must be displayed by the agricultural and processing enterprises in the final results of the meat branch.

Under the new method for livestock acceptance, the agricultural enterprises are being thoroughly motivated with regard to the final product. This is being promoted primarily by the use of procurement prices for meat which were established taking into account the procurement prices for livestock in live weight and stable conversion factors which endure over an extended 10-year period. For actual meat yields which exceed the norms called for in the prices by one percent, the earnings per ton of live weight of large-horned cattle in a high state of nourishment increase by 40 rubles, average state of nourishment -- by 34, lower than average -- by 28 and lean or gaunt -- by 24 rubles; the figures for sheep, depending upon their state of nourishment -- range from 38 to 23 rubles respectively and swine -- from 30 to 22 rubles. At the same time, material incentives are issued for procurements of young stock which are of raised weight and thus ensure greater meat yields.

At the same time, the processing enterprises, in the case of calculations for livestock according to meat yield, are not sufficiently interested in the proper use of the initial raw materials or in protecting the meat products during all stages preceeding its crediting. This leads to shortcomings in the organization of procurements and in the processing of the livestock, the elimination of which is greatly dependent upon the meat combines.

We are of the opinion that the processing enterprises must display greater interest in protecting and utilizing in the correct manner not only the meat credited but also the initial raw materials expended for obtaining it. Towards this end, we consider it advisable, in addition to the dressed and converted weights, to take into account in the receipts the actual live weight of the livestock sold. When use is made of calculations with the farms for livestock according to the quantity and quality of meat, which following the slaughtering of the animals must be determined more objectively and a test for plan fulfillment according to converted weight, the real live weight must be used for revealing deviations between the actual and normative yield of meat, which is equivalent to a deviation between the converted and real live weights.

We consider such an approach for comparing the actual and normative meat yield to be more economical, since the group weighing of a group of livestock sold will be adequate for determining live weight, regardless of their age or nutritional state. This simplifies the operation considerably and makes it acceptable from a practical standpoint. The weighing of livestock at Tsentrovoyoz is carried out on a farm in the presence of a driver-forwarding agent and when exported using one's own transport -- at the meat combines.

At the same time, the availability of objective information concerning meat yield deviations from the established normatives will make it possible to employ more efficiently the appropriate material stimuli and to an equal degree for agricultural enterprises and the processing industry. Their interest in increasing the final product can be raised by lowering, retaining or increasing the meat value included in the production expenses, in an evaluation based upon regulating prices and depending upon the degree of deviation of the actual and normative meat yields. Towards this end, the data on the receipt is supplemented by information on the actual live weight and the percentage of deviation between the converted and actual live weight is also calculated. This percentage is used for correcting, in an inverse relationship, the cost of the raw materials in an evaluation based upon regulating prices.

For example, on 1 September 1980 the Kolkhoz imeni Gastello in Minskiy Rayon delivered 21 head of young large-horned cattle stock to the Minsk Meat Combine. The live weight of the animals was 7,890 kilograms and they were in a high state of nourishment. Following their slaughtering, 4,162 kilograms of meat were obtained and the converted weight -- 8,598 kilograms. The additional meat yield compared to the norm was 9 percent (8588 kilograms/7890 kilograms), or 344 kilograms (4162 kilograms - 4162 kilograms/109% X 100% = 3818). The actual expenses of the processing enterprise for procuring the meat, in an evaluation based upon regulating prices, was 6,576 rubles. (1,580 rubles X 4.162 tons), including above-norm -- 544 rubles (1,580 rubles X 0.344 tons). Taking into account a correction for these expenses for the percentage of additional meat yield, they amount to 6,527 rubles (1,580 rubles X 3,818 tons + 1,438 rubles (91% of 1,580 rubles) X 0.344 kg = 6,032 rubles + 495 rubles = 6,527 rubles), or 0.8 percent lower than actual.

It is apparent that when the mentioned recommendations are employed, depending upon the meat yield, corresponding changes take place not only in the earnings of the kolkhozes and sovkhoses for the livestock sold but also in the expenditures of the processing enterprises for procuring the raw materials and this conforms directly with the cost accounting interests of each branch. In view of the fact that the cost of raw materials in the structure of production expenses for enterprises of the meat industry exceeds 90 percent, a reduction of 0.7-0.8 percent in it promotes an increase in cost accounting profitability of almost 1 percent.

In addition to increasing economic interest in the final results, the availability of information on the actual live weight of the livestock and the products obtained following their slaughtering will make it possible to uncover the available reserves for increasing meat output in all of the technological echelons of production, procurements and processing, to control these processes more efficiently and, in the final analysis, to satisfy more completely the tasks of the agroindustrial complex.

COPYRIGHT: "Zakupki sel'skokhozyaystvennykh produktov", 1981

7026

CSO: 1824/458

CURRENT TASKS OF ANIMAL BREEDING CENTERS SET FORTH

Moscow ZHIVOTNOVODSTVO in Russian No 7, Jul 81 pp 2-4

/Article: "Tasks of Breeding Centers"/

/Text/ The country's livestock breeders face important and responsible tasks during the current five-year plan. During the 11th Five-Year Plan the average annual production of meat should reach 17 to 17.5 million tons, of milk, 97 to 99 million tons, of wool, 470,000 to 480,000 tons and of eggs, 72 billion. At the same time, the production of livestock products will increase mainly as a result of the intensification of animal husbandry, which, as world experience shows, is possible only provided pedigree work is well organized, existing breeds of farm animals are improved and more productive, new breeds are developed.

The decree of the CPSU Central Committee and the USSR Council of Ministers "On Measures for the Further Improvement of Pedigree Stockbreeding in Animal Husbandry" (1978) determined the tasks for the expansion of the network of pedigree farms and enterprises, strengthening of their material and technical base and a more purposeful utilization of the resources of highly productive livestock and poultry and outlined the basic directions in breeding based on animal species.

In accordance with this decree work on the development of new breeds, breeding groups, types and lines of farm animals characterized by a high productivity and adaptability for industrial technology expanded in the country. This work is carried out on more than 200 farms and, in fact, encompasses all the Union republics.

In the country there are 23 breeding centers of Union importance and a number of regional breeding centers, which carry out pedigree work with all species and breeds of farm animals. Of this number nine breeding centers work with individual breeds of large-horned cattle and hogs, four, on bee keeping, horse and fish breeding and fur farming and nine, with individual animal species. The Head Breeding and Genetic Center was established for the purpose of guiding pedigree work and coordinating the activity of breeding centers (in the structure of the All-Union Scientific Production Association for Pedigree Stockbreeding in Animal Husbandry).

The tasks of breeding centers include methodological guidance of pedigree work with breeds of farm animals; improvement in the pedigree and productive qualities of existing breeds and intrabreed types and lines and development of more highly productive, new ones through pure breeding and crossing with the utilization of

the best world and domestic gene pool; production, raising and evaluation of sires; detection of prepotent improvers and their wide utilization for the development of highly productive, new lines and related groups of animals. All these, as well as a number of other tasks of breeding centers, were determined by the corresponding statute approved by the USSR Ministry of Agriculture.

In their functions animal husbandry breeding centers differ significantly from scientific institutions engaged in animal breeding. Methods of developing more productive, new breeds and types of animals are devised in scientific research institutes. However, breeding centers are engaged in work on the introduction of breeding achievements mainly through a wide utilization of sires, which have received a high evaluation for the quality of their progeny.

Breeding centers analyze and direct pedigree work in the zone of their activity and make proposals on an increase in its efficiency; guide the improvement of existing and development of new breeds; examine the drafts of breeding and scientific plans; publish catalogs and bulletins; keep card files of pedigree plants, sovkhoses and enterprises and regularly recertify them; control the utilization of highly productive animals.

Breeding centers direct the activity of state pedigree enterprises, state pedigree stations and artificial insemination stations (their provision with sires, organization of ordered matings, selection and testing of sires for their productivity and quality of progeny). At present they do this work on a contractual basis.

Since breeding centers are established under scientific research institutes or higher educational institutions, they remain their subdivisions and are financed and operate according to the general plans of institutes. At the same time, the experience of the Moldavian SSR and the Belorussian SSR indicates that good results in the improvement of pedigree stockbreeding are obtained when breeding (research) centers and pedigree farms form a single whole from the scientific and methodological, as well as administrative, points of view.

During the period of formation, which breeding centers now undergo, they should have independent topics included in the institute's general topical plan, funds and material resources for the performance of breeding work.

Inventory of all pedigree plants, sovkhoses and farms--candidates for pedigree farms--and giving them practical help in the organization of pedigree recording and in the preparation of long-term plans for pedigree work and their fulfillment are important tasks of breeding centers. At the same time, highly productive breeding stock should be placed under control and its ordered mating with sires for the production of outstanding continuers and ancestors of highly productive lines, related groups and intrabreed types of animals should be organized.

Breeding centers work out long-term breeding programs for breed improvement, which include the production, raising and evaluation of sires by their productivity and quality of progeny, as well as their pedigree utilization, and the development of methods of improvement of animals of various breeds on the basis of the achievements of population genetics, cytogenetics, immunogenetics, knowledge of the patterns in the individual development of the animal organism and other latest studies in the field of biology.

It should be noted that, despite the short period that elapsed from the time of organization of breeding centers, many of them purposefully implement measures for the development of new and improvement of existing breeds of farm animals.

The breeding centers of the All-Union Scientific Research Institute for the Breeding and Genetics of Farm Animals and of the All-Union Institute of Horse Breeding and a number of others began their work satisfactorily.

The material and technical strengthening of pedigree farms, plants and sovkhoses, as well as commodity farms, on which new breeds are developed through interbreed crossing or hybridization, is an important task of agricultural bodies and of managers and specialists of agricultural enterprises. Experience shows that the greatest advances in this matter are made where pedigree farms are specialized and field cropping, capital construction and other sectors are subordinated to the interests of pedigree stockbreeding.

The fact that, when new breeds are developed, animals of an average and sometimes even of a low productivity and pedigree value are used as the initial genetic material is a shortcoming in the work of breeders. For example, breeders working in wool sheep breeding, when developing new breeds, use highly valuable sires (including Australian merinos) for unproductive sheep populations. Therefore, it is difficult to expect the production of highly productive, qualitatively new animals.

As domestic and foreign experience shows, a wide utilization of sires evaluated by the quality of progeny in the pairing network is the most efficient method of improving genealogical groups of animals.

The Master bull belonging to the Central Station for Artificial Insemination of Farm Animals under the All-Union Scientific Production Association can be cited as an example of an efficient utilization of sires tested for their progeny. On all farms his daughters surpass their contemporaries in productivity by 1,200 to 1,600 kg of milk and consume 8 to 10 percent less feed for the formation of 1 quintal of milk.

Computer technology, modern methods of genetics and immunogenetics and the achievements of biological and zootechnical science have now come to the aid of the breeder evaluating sires by their progeny. However, they cannot replace the creative labor of the breeding zootechnician--they only facilitate the technical work on the collection, storage and processing of information. As during previous years, an objective evaluation of sires by their progeny largely depends on the breeder, who, in addition to extensive practical skills and good knowledge of breeds and individual herds, should be thoroughly familiar with modern mathematical and immunogenetic methods.

Work on an evaluation of sires has been greatly activated on farms in the Baltic republics and in Leningrad, Moscow, Sverdlovskaya, L'vovskaya and some other oblasts in the last few years. On these farms more than 30 percent of the cows and heifers are inseminated with the sperm of bulls tested for the quality of their progeny and considered improvers. This made it possible to greatly improve the productivity of animals in a relatively short time.

However, throughout the country the situation with the evaluation of sires by their progeny remains extremely unsatisfactory and in a number of regions there is a formal approach to this measure. On many farms sires are tested against a low zootechnical background. As a result, bulls inferior in genetic qualities receive a higher evaluation and this can do considerable damage to animal husbandry.

Our country has varied natural-climatic and economic conditions. Therefore, it is quite natural that equally highly productive pedigree livestock is not bred in all regions. Nevertheless, only home bred sires are used in the pairing network on a number of farms, although their productive potential is much lower than that of sires bred in regions with intensive animal husbandry. On many farms in Georgia, Armenia, Azerbaijan and Kazakhstan it would be advisable and useful to concentrate the attention of specialists on the use of sperm accumulated in other republics from highly productive sires for the insemination of dams.

Domestic zootechnical science faces important and responsible tasks. Whereas in the last few years scientists have developed valuable and effective recommendations on problems of selection and evaluation of farm animals (including pedigree animals), there are hardly any studies of problems of selection and early evaluation of productivity and pedigree value. Research on karyotypes and characteristics of blood groups should be intensified and extended and the immunogenetic methods of control (in connection with the health and productivity of animals) should be improved. It is also necessary to more rapidly complete the development of methods of prolonged storage of the sperm of boars and rams and of transplantation of zygotes and embryos.

As is well known, highly productive animals require special technologies of feeding and keeping, which take their individual characteristics into consideration. Scientists working on an improvement in the technology of industrial animal husbandry must more rapidly develop technologies that would take the characteristics of highly productive animals of various species into consideration.

The wide use of computer technology and of the achievements of scientific and technical progress in pedigree work does not diminish the role of breeders. Without the knowledge of breeds and herds it is impossible to make any significant advances in pedigree stockbreeding. At the same time, in the last few years many agricultural higher educational institutions in the country have slackened their attention to teaching pedigree stockbreeding, which cannot be considered normal. Without belittling the importance of training zootechnicians in methods of industrial technology of animal husbandry, their knowledge in the area of large-scale breeding should be expanded. Future specialists must master modern methods of pedigree work.

In order to retrain specialists in pedigree stockbreeding, a higher breeding and genetic school was organized under the All-Union Scientific Production Association for Pedigree Stockbreeding in Animal Husbandry. Its first 76 graduates completed their courses in May 1981 and returned to their jobs. However, one school will not solve the problem of personnel retraining. It is necessary to expand the training of breeders in zootechnical faculties of higher educational institutions.

An improvement in the activity of animal husbandry breeding centers will contribute to a further increase in the production of livestock products and to a successful fulfillment of the tasks set in the decisions of the 26th CPSU Congress for a rise in the people's well-being.

COPYRIGHT: Izdatel'stvo "Kolos", "Zhivotnovodstvo", 1981

11,439

CSO: 1824/467

REGIONAL DEVELOPMENT

ACADEMICIAN VAVILOV DISCUSSES TASKS OF AGRICULTURAL SCIENCE

Moscow VESTNIK SEL'SKOKHOZYAYSTVENNOY NAUKI in Russian No 8, Aug 81 pp 13-28

[Article by Academician P.P. Vavilov of the All-Union Academy of Agricultural Sciences imeni Lenin, president of the All-Union Order of Lenin and Order of the Red Banner of Labor Academy of Agricultural Sciences imeni V.I. Lenin: "The Tasks of Agricultural Science in the Light of the Decisions of the 26th CPSU Congress"]

[Text] The report of the General Secretary of the CC CPSU comrade L.I. Brezhnev at the 26th Congress of the Communist Party of the Soviet Union contains an especially forceful statement about increasing the role of science in the development of the country's productive forces. "There is no need to convince anyone," said comrade L.I. Brezhnev, "of the great importance of science. Our party of communists proceeds from the idea that without science the construction of the new society is simply inconceivable." These words also apply directly to agricultural science. At the congress it was emphasized that "...science itself must be a constant 'disturber of the peace,' showing us in which sectors stagnation and lagging has occurred, and where the present level of knowledge makes it possible to move forward more rapidly and successfully."

These statements have to become the general line of our work. In science, as in production, there are quite a few bottlenecks. And this means that the All-Union Academy of Agricultural Sciences imeni Lenin and its regional divisions, our scientific research institutions and our vuzes have to concentrate all of their efforts and resources on the most rapid solution of the chief problems of the economic and social development of the country's agrarian sector.

Scientists as well as agricultural workers will have to achieve a substantial increase in the production of grain, feeds, and other output. At the congress animal husbandry was named a shock front in the village, and this obliges scientists to increase the effectiveness of their influence on this branch of agricultural production.

The increase in gross agricultural output during the 11th Five-Year Plan will come to 12-14 percent, compared to nine percent in the 10th Five-Year Plan; in monetary terms this is 75-86 million rubles, compared to 50 billion rubles in the 10th Five-Year Plan. While fixing very strenuous assignments for the 11th Five-Year Plan, the party is doing everything possible for these plans to be backed up

by the balanced interconnected development of the other spheres of the agro-industrial complex.

It is emphasized in the decisions of the 26th Party Congress that agriculture will continue to be allocated large financial and material resources; however, the center of gravity today--and this is the distinguishing characteristic of agrarian policy in the 1980's-- is being shifted to an increase in the return from capital investment, an increase in the productivity of agriculture, and to deepening and improving its relations with all of the branches of the agro-industrial complex.

The new tasks which have been set by the party demand, as comrade L.I. Brezhnev emphasized, the use of fundamentally new scientific ideas and technical solutions and a concentration of efforts on the key directions of economic development. We have to be clearly aware of the fact that the desired goals can only be reached with an overall approach to their attainment by the agricultural agencies, science, and the ministries and departments which are a part of the agro-industrial complex.

In accordance with the decisions of the 25th and 26th CPSU Congresses, it is necessary to change over to special-purpose planning which orients the development of all of the branches of the agro-industrial complex toward increasing the production of final output. We have to use land, water, equipment, fertilizers, and working time thriftily and economically. This is now the most important thing. It is the goal of the decisions of the Congress. More output has to be produced and everything which has been produced has to be preserved and brought to the consumer. These tasks can be accomplished on the basis of special-purpose overall programs.

In the system of measures aimed at improving the well-being of the Soviet people an especially important place will be assigned to the food program. As was emphasized at the 26th CPSU Congress, it "has to ensure a substantial increase in the production of agricultural output....and bind agriculture more closely to the branches engaged in the storing and processing of its output. And, of course, to trade. In other words, its goal is to accomplish the task of uninterrupted food supplies for the population as rapidly as possible."

The realization of the food program has to be ensured above all by means of changing the character of agricultural production itself. In this connection, our institutes, vuzes, and experimental stations will have to strengthen research on the development and practical implementation of an improved use of natural, biological, technical, economic, organizational, and social factors and resources, on a comprehensive intensification of production, on shifting farming and animal husbandry onto an industrial basis, and on increasing the efficiency of agriculture and of the agro-industrial complex as a whole.

In addition, it is necessary to solve the scientific problems connected with shifting from the branch type of production organization and management by individual stages which now predominates to a systems and integrated type. The interconnected performance of production and output processing within the entire food complex of the country will make it possible to eliminate bottlenecks and

disproportions more rapidly, to decrease losses of agricultural output, and to reduce specific capital investments and the expenditure of resources. This will be fostered by special-purpose overall scientific and technical programs. The USSR State Committee for Science and Technology, USSR Academy of Sciences, and Gosplan USSR have approved seven large special-purpose programs which are closely connected with agricultural production. In addition, 16 overall interdepartmental and 45 departmental programs on the most important problems of agricultural development have been worked out and approved. The leaders of scientific institutions have to take all of the necessary measures for their absolute fulfillment.

An improvement of the economic mechanism of economic management is being assigned an especial place in the solution of the food problem. The effectiveness of any scientific proposal on selection, crop cultivation technology, animal husbandry, or mechanization depends first of all upon the creative energy of scientists and upon a rational use of the productive forces. For this reason, one of the most important task of science is to achieve the active operation of economic, social, and organizational factors in order to increase the return from the material and technical and scientific potential which has been built up.

Recently there has been a substantial strengthening of research on the formation and development of the agro-industrial complex, but there are also quite a few questions for which science has not yet given clear proposals. Research has to be expanded on improving the planning and management of the agro-industrial complex, increasing the return from capital investments and material resources, and strengthening the interest of all production participants in final results. Concrete proposals should be worked out on improving the production-economic relations of agricultural with other branches of the agro-industrial complex.

Agricultural economists must not only generalize the experience and study the problems of production specialization and concentration, but, above all, define the development prospects of these processes in agriculture. It is necessary to move more actively toward the development and evaluation of different model variants of the farms and associations of the future. On the basis of experiments under production conditions scientific tests and substantiations of promising types of enterprise and associations should be performed, and the most rational forms of interfarm cooperation and agro-industrial integration established. It is essential to be more bold in making proposals on improving the organization of labor and production, strengthening cost accounting, increasing profitability, and improving the financial state of farms. Economic stimulation is an important element of the mechanism of economic management. Agro-economic science has to deepen research on strengthening the interest in the final results of labor and in high qualitative indicators in all of the elements of production--the branch, the enterprise, the labor collective, and the individual worker.

It is necessary to expand research on the joint use of the entire arsenal of the economic regulation of production in the country's different zones. This work has to embrace procurement prices, financing, credit, and the consistent introduction of cost accounting.

One of the important factors in increasing the efficiency of the use of resources

is an improvement of production organization by the regions of the country. In preparing scientific proposals the point of departure here should be the necessity for a fuller use of the bioclimatic, demographic, and economic potential of regions (oblasts, krais, republics), a deepening of the interregional division of labor, and the creation of specialized zones for the production of specific types of output. These problems should be reflected above all in the oblast, kray, and republic systems of agricultural management which are being developed.

Scientific institutions have to devote more attention to the problems of the development of the population's private subsidiary farms. Under present-day conditions science cannot stand aside from the measures which are being taken for a fuller use of the potentialities of the population's private subsidiary farms and the subsidiary farms of enterprises. Effective methods for the economic and moral stimulation of the development of private subsidiary farming are needed, and it is necessary to practice more widely the various types of assistance to the population in this important state matter and to substantiate forms of integrating private farming with public farming.

A solution of the social problems of the village is one of the most important conditions for the development of agriculture. New approaches are now needed for the development of the village, the creation of the social infrastructure, the reproduction and use of labor resources, and the training and permanent establishment of cadres. Insufficient attention to social problems in a number of areas of the country has become the chief reason for an undesirable population migration and a brake upon the development of agriculture. In accordance with the decisions of the 26th CPSU Congress, large capital investments are being assigned for the social development of the village. Compared to the previous one, during the 11th Five-Year Plan the resources being assigned for these purposes will increase by 39 percent, while total capital investments in agriculture will increase by 12-15 percent. In order to realize this large amount of capital fully and on a scientific basis it is necessary to develop modern methodologies of social planning and of developing labor collectives and agricultural enterprises. Scientific work has to be strengthened on raising the standard of living of the rural population, regulating migration processes, and influencing them in the direction of developing the entire economy.

A comprehensive intensification of agricultural production and its specific character which is connected with its seasonal nature and dependence upon many natural and socio-economic conditions demands fundamentally new methodological approaches to research. The employment of a systems analysis for the subjects of agricultural science is a very important methodological task both for the development of systems of farming and farm management and for the search for ways to prevent or overcome negative ecological and social consequences. It is necessary to determine the principles of the creation of cultivated ecosystems or agrobiocenoses which will ensure the production of a maximum amount of the economically valuable part of the biomass during the frost-free period with reasonable expenditures of energy. With a smaller number of components biocenoses should preserve and increase the fertility of soil and promote environmental protection.

The Basic Directions of the Economic and Social Development of the USSR for 1981-

1985 and for the Period Until 1990 emphasize the importance of preserving and increasing soil fertility, increasing the efficiency of land use, and, on this basis, achieving a constant increase in yields.

The productivity of fields is reliably increased by a rise in the standard of farming which is formed from a complex of agronomy, technological, and organizational measures. Scientific institutions and vuzes have to improve zonal soil protection systems for conditions where agricultural production is specialized and concentrated and speed up the introduction of their recommendations. The Presidium of the All-Union Academy of Agricultural Sciences imeni Lenin and the Board of the USSR Ministry of Agriculture have examined the methodological instructions on developing these recommendations for the oblast, kray, and republic. The introduction work should be directed and activated by the All-Union Institute of Farming and Soil Protection Against Erosion.

An intensification of farming demands a constant improvement of the methods and systems of soil cultivation. With the increase in the power, speed, and mass of agricultural machinery negative aspects of intensive soil cultivation began to show up and contradictions arose between its agrotechnical necessity and its action on fertility. In present-day farming the forefront is being occupied by a study of the problems of minimizing soil cultivation, reducing the number and depth of cultivation operations, and combining a number of technological operations into a single process.

Substantial work is being performed in the USSR on protecting soils against erosion. Success in the fight against wind erosion in the steppe areas of Northern Kazakhstan and Siberia has been especially appreciable. To a definite extent the average annual production of grain in Kazakhstan has increased by 1.5 times as a result of this, and, most important, the destruction of the fertile soil strata has stopped. For areas where there is both wind and water erosion in recent years highly effective methods and technologies have also been worked out which include minimalization and soil cultivation crosswise against slopes, a radical sowing of eroded lands to grass, and the flattening of ravines. However, on the whole, the problem of protecting soils against water and water-wind erosion has still not been solved, and zonal systems of soil protection have not been developed everywhere. Solely because of an incorrect use of hilly land of which we have more than 100 million hectares we lose from 20 to 60 percent of the harvest in certain areas. The problems of mountain farming, especially the mechanization of operations in mountainous areas, are being solved impermissibly slowly.

By 1985 agriculture will receive 115 million tons of mineral fertilizers in conventional units. In order to obtain a higher return from them scientific institutions have to recommend for introduction into production more economical methods of using fertilizers in crop rotation, which will increase the coefficient of the use of nutritional substances. It is very important to activate research on creating methods for the local application of fertilizers and developing and producing special combined grain-fertilizer sowers and machines for the local application of full fertilizer doses in combination with pre-sowing soil cultivation.

Organic fertilizers of which around 800 million tons are applied every year are a

large reserve for increasing harvests. However, an enormous amount of organic fertilizer remains unused because of the low level of mechanization for its application. Scientists have developed highly productive machines for the application of organic fertilizers; however, industry is producing hardly any of them.

An increase in the efficiency of the use of reclaimed lands is becoming especially important. Zonal systems of reclamation farming must be worked out. The real possibility already exists on these lands for directed programming and for growing large planned harvests. Scientists from zonal institutes and from other institutions of the All-Union Academy of Agricultural Sciences and the ministries have to be enlisted in this task.

Approaches to obtaining high yields of agricultural crops on the basis of programming have been worked out, and the recommendations should be used now, especially in areas where this is favored by soil and climate conditions. However, in the country as a whole the solution of this difficult and important problem is possible only on the basis of a special-purpose programmed and systems approach aimed at the rational use of material and technical resources for obtaining planned harvests and the expanded reproduction of soil fertility. This kind of system has to take overall account of all of the basic factors which act upon soil and plants. A highly important element in it is a land resources inventory service which is based upon the fullest possible information about soil types, fertility, climate characteristics, the suitability of soils and of the entire bioclimate potential for the cultivation of specific crops, and methods of soil cultivation and improvement.

It is very important to propose methods for obtaining sufficiently simple and integrated indicators of soil value and bioclimatic potential in order to later develop information on every field and its dynamics on computers, to scientifically plan the structure of sown areas, and to distribute fertilizers and other material and technical resources so as to raise a maximum harvest while preserving soil fertility and protecting the environment against pollution. The development of this kind of complex will create the conditions for a better substantiation of harvest programming.

There will have to be a development of methods for maintaining optimal physical-chemical and biochemical modes for irrigated and drained soils, managing the fertility of the irrigated soils of the non-irrigation zone, economizing irrigation water, and making repeated use of drainage waters for irrigation. It is important to strengthen research on forecasting and on the scientific bases of the struggle against the swamping, salination, desert-creation, and degradation of soils, and to be more active in solving the problem of improving alkaline lands, this important reserve for increasing the production of grain, feeds, and other cropping output.

It is extremely important to provide feeds for public and private animal husbandry.

Although the production of feeds has increased in recent years, the needs of animal husbandry continue to be far from fully met. The quality of the feeds remains

low, and losses of nutritional substances are great. The 26th CPSU Congress established as an urgent measure the creation of a reliable feed base on every kolkhoz, sovkhoz, and interfarm enterprise. By 1985 it is necessary to produce annually around 500 million tons of feed units--1.3 times more than today. This task is difficult, but realizable. Domestic science has already developed and made practical tests upon complexes of technological methods for the different zones of the country which make it possible to obtain from a hectare of unirrigated field and meadow land 4,000-5,000 feed units, and, with irrigation, 12,000-15,000 feed units. Technologies for procuring and storing feeds have been created which save 90-95 percent of the harvest. Unfortunately, for various reasons these proposals are being introduced extremely slowly, and feed losses reach almost one-third of their harvest.

It is necessary to improve the technology of field and meadow feed production on irrigated lands.

It is necessary to create the scientific bases of the organization of specialized feed production enterprises and associations in order to transform this into an independent branch. Industrial seed growing for feed crops and, especially, perennial grasses will have to be organized very rapidly, selection will have to be strengthened, and varieties which meet the requirements of intensive farming will have to be created.

Another fundamental problem is facing our researchers--to find ways for the fullest and most effective use of all vegetable feed resources. It is essential to substantially expand the search to increase the productivity and rational use of natural feed lands--meadows and pastures,--and to create new effective technologies for harvesting, preparing, and processing straw and other cropping wastes. Improved methods and technologies of harvesting, procuring, and preserving feeds which guarantee their safe keeping and nutrition are needed. Then, with relatively small expenditures, it will become possible to increase feed resources by 20-25 percent. A wide circle of scientists--microbiologists, physicists, chemists, and biochemists--has to be enlisted in the solution of this problem.

The 11th Five-Year Plan will see the creation and delivery to production of machines for the radical and surface improvement of feed lands, self-propelled highly productive machines for the harvesting and pulverization of grasses and silage crops, wide-grab self-propelled mower-crushers and other equipment which mechanizes the procurement, processing, storage of feeds with a maximum safeguarding of nutritional substances. It is important to complete the creation of a complex of highly productive machines for the drying of green feeds, grass seeds, sorghum, and corn.

In the report by comrade L.I. Brezhnev at the 26th CPSU Congress it was noted that grain is a highly important component part of the feed base. The emphasis is being placed above all on increasing the production of fodder grain. Scientists have to propose the most effective ways of increasing the production of fodder grain above all by means of increasing yields, and also through a substantial expansion of the areas sown to peas, barley, oats, and corn with a certain decrease in

spring wheat.

As was emphasized in the Summary Report of the CC CPSU to the 26th Congress, "... the time has come to actively begin to work on a planned shift--with regard to natural and economic conditions--to a more rational structure for our grain lands. The decisive word here belongs to science and our specialists." Agrarian scientists look upon this appeal as a direct charge by the CC CPSU for the 11th Five-Year Plan.

A more thoughtful approach has to be taken to the organization of crop rotations through the improvement of the structure of sown areas. There has to be judicious and scientifically substantiated decisions on saturating them with the most productive grain and pea crops. In arid areas clean fallows have to remain a mandatory element of crop rotation. Perennial grasses, especially lucerne and clover, are of especial importance in zones with sufficient moisture and on irrigated and drained lands. Intermediate crops have an important place in the intensification of crop rotation. A rational structure for sown areas will provide for high stable gross grain harvests and will make it possible to sharply increase the production of vegetable protein and, at the same time, to maintain a positive balance of humus and nitrogen in the soil.

The overall scientific and technical program has defined the chief directions for the development of scientific research on increasing grain production. It is planned to create and introduce into production 215 varieties and hybrids of grain and pea crops, to develop 16 new industrial technologies for growing them, and to create and organize the series production of new machines. The realization of this program will yield an additional 15 million tons of grain annually--almost one-half of the increase planned for the 11th Five-Year Plan.

The creation and introduction into production of new varieties and hybrids is an important reserve for increasing the yields of all crops. During the past five-year plan quite good results were achieved in the selection of most agricultural crops. More than 700 new varieties and hybrids were created and regionalized, and of them more than 30 were of winter wheat, 10--rye, 38--spring wheat, and 33--spring and winter barley.

Fundamentally new problems of selection have been solved which have involved the creation of the first short-stem highly productive varieties of rye--Voskhod-2 and Chulpan and of winter wheat, of Odessa semi-dwarf, Semi-Dwarf-49, and other wheat varieties, a non-crumbling pea, and millet which is resistant to smut. High yield winter and spring varieties of wheat, tritikale, and of fodder and brewing barley are being successfully introduced on the fields of our farms.

However, not all of our selection specialists are working effectively. Around 82 percent, or 18.5 million hectares, of our winter wheat lands are occupied by varieties from four selection centers--Mironov, Odessa, Rostov, and Krasnodar,--while the varieties from the remaining 47 selection centers occupy only 18 percent. Approximately the same relationship has developed in the regionalization of spring wheat and other very important crops. It is obvious that a most careful

analysis of the work of selection institutions has to be carried out again and effective measures taken to increase the results they achieve.

In recent years major shortcomings have been brought to light in selection and seed growing for a number of crops. Production is dominated by corn and sunflower hybrids with an extended vegetation period, which delays the harvest of these crops. This is one of the reasons why a substantial amount of the corn which is grown for grain is mowed down for silage. Coming late into its ripening stage, the sunflower falls under conditions which promote the development of diseases, especially gray and white rot, which sharply reduces yields and worsens the quality of the seeds. There is lagging in the selection and introduction into production of a hybrid sunflower, winter and spring rape and of sugar beet hybrids on the basis of cytoplasmic male sterility.

There are serious shortcomings in the selection of pea crops. Practically all of the pea varieties which have been created sharply reduce harvests during unfavorable conditions and have a low multiplication coefficient. In five years the area which is sown to the very valuable non-crumbling-1 variety which has been regionalized in 55 oblasts, krais, and republics has increased only to 60,000 hectares. But in our country peas serve as the basic source of protein in concentrated feeds, and their selection has to be greatly improved. The selection of lupine, rape, peavine, lentil, feed beans and vetch is insufficiently effective. Soy bean selection has to be greatly strengthened not only in the Far East, but also in the south of the European part of our country. Highly productive varieties of buckwheat and millet are being developed slowly.

The head institution--the All-Union Scientific Research Institute of Pea and Groat Crops--has to draw the correct conclusions from the criticisms which were made of it at the All-Union Agronomy Conference, the Board of the USSR Ministry of Agriculture, and the Presidium of the All-Union Academy of Agricultural Sciences imeni Lenin.

The institute's collective has to substantially reorganize its work and increase the effectiveness of research on pea and groat crops.

It is extremely important to strengthen heterosis sunflower selection, and to substantially expand the areas sown to hybrids of this crop in the next few years. To date only one hybrid--Rassvet--has been regionalized and introduced. The scientific production association for oil-producing crops has to unite the efforts of the country's selection specialists and sharply increase the results of their research.

The most important thing in the selection of corn is to create high yield early-ripening and mid-season-ripening hybrids. There has been progress in this direction: the "Sever" group which unites the collectives of a number of experimental selection institutions has been working successfully under the leadership of Academician G.S. Galejev of the All-Union Academy of Agricultural Sciences imeni Lenin. However, the situation remains alarming. The All-Union Scientific Research Institute of Corn is reorganizing its work very slowly and a substantial number of its associates are studying problems which are not connected with corn,

while measures are not being taken to strengthen the selection center with highly qualified cadres. We hope that with the creation of a scientific production association there will be a sharp increase in the results of this institute's work.

In view of the difficult situation, the Presidium of the All-Union Academy of Agricultural Sciences and the USSR Ministry of Agriculture are devoting constant attention to the organization of corn selection and of hybrid sunflowers and pea crops. Long-term programs have been reviewed and new tasks have been set. In particular, it has been planned to create several creative groups for the selection of early ripening corn hybrids, and to increase the overall nature of research.

There are still very few high-yield single-seed sugar beet hybrids on the basis of cytoplasmic male sterility in the country. Many hybrids have a low seed germinating power and a lowered tuber sugar content, and produce a high percentage of bolting. They are poorly adapted for industrial technology and industrial seed growing. There has to be a substantial strengthening of sugar beet selection, and methods of transplantation-free seed growing have to be developed and introduced.

The problem of selection for immunity has become especially acute. A large number of grain crop varieties are not resistant to rust, smut, and powdery mildew, and all of the varieties of sunflower are receptive to gray and white rot; varieties of potatoes which are resistant to phytophthora are being created slowly. Selection for resistance to pests is being performed extremely poorly. In many areas grain crop damage through root rot is increasing and because of it more than one-fourth of the harvest is lost. But selection for resistance to these pathogens is being performed poorly. Areas sown to varieties which are resistant to the basic diseases do not surpass 10-15 percent. The Presidium of the All-Union Academy jointly with the USSR Ministry of Agriculture is activating selection work for immunity. During the next seven-eight years immune varieties could occupy one-half of our sown lands, and this alone will increase gross harvests of cropping output without additional expenditures by 14-15 percent. Production also needs new chemical, biological, physical, and other methods of fighting diseases and pests.

Plant selection for salt tolerance, cold-resistance, and resistance to other unfavorable factors is in need of greater attention. How important this direction of research is can be seen from the fact that because of insufficient resistance to unfavorable conditions and diseases, violations of agrotechnics, and insufficient fertilizers the potentialities of many present-day varieties are realized by only 30-40 percent. In the regionalization of new varieties the state commission on variety testing must give preference to those varieties which are not only marked by a high potential productivity, but which also provide more stable harvests under diverse weather conditions. The achievements of genetics, molecular biology, biochemistry, physiology, and other sciences are a support in the accomplishment of the difficult tasks of today's selection.

In recent years a good material and technical base has been created in the leading cropping selection centers--selection complexes and greenhouses have been built. Large phytotrons have been created in the Mironov and Odessa selection centers. We have the right to suppose that the scientists of these collectives, employing modern equipment and progressive selection methods, will create valuable varieties

and hybrids during the 11th Five-Year Plan. It is to be hoped that the scientists of the All-Union Genetic Selection Institute will also accomplish their second chief task--to propose new methods and technologies for the selection process. Of course, this is not the work of a single year, but a solid material and technical base, highly qualified cadres, and an accumulation of work experience make it possible to complete the basic development work as early as the present five-year plan. In essence, we are talking about the biotechnology of creating new forms of plants which makes it possible to design genotypes with an assigned complex of characteristics and properties. A number of institutes of the All-Union Academy of Agricultural Sciences have begun research in the field of molecular biology and genetics and have introduced new methods of obtaining starting material for selection, including with the use of fabricultures. However, much still has to be done, in particular, a strengthening of research on increasing the intensity of the biological fixation of nitrogen with cultivated plants.

Wider use has to be made in the accomplishment of the tasks facing selection of the very rich genetic fund of cultured plants and their wild kinsmen which is concentrated in the All-Union Institute of Cropping imeni N.I. Vavilov.

In certain selection institutions little is being done on the organization of seed growing for new varieties and this is resulting in a substantial loss of grain and other cropping output. Selection specialists have to show more initiative and persistence in speeding up the introduction of new varieties. If there is confidence in the fact that a new variety surpasses the regionalized ones, its seeds have to be multiplied in advance for wide-scale introduction as is done in the Mironov and certain other selection centers.

The development and introduction of industrial technologies for growing the basic agricultural crops is one of the very important directions. It requires an organizational restructuring of research. Traditionally, the individual elements are worked upon separately in our institutes--sowing norms and methods, fertilizer application variants, and pest and disease protection. But all of them have to be gathered into a single technological chain and the most effective variant has to be selected. It is essential to change over to overall research involving the participation of agriculturists, plant specialists, plant protection specialists, mechanization specialists, and economists.

An overall approach is also necessary in the development of integrated disease and pests plant protection systems. As the experience of growing cotton in Tajikistan has shown, the introduction of an integrated system sharply reduces the expenditure of pesticides and, with relatively small expenditures, creates an agrobiocenosis which is capable of producing high and stable cotton yields with minimum environmental pollution. The shift to industrial technologies and to an integrated system of plant protection is closely connected with the creation and use of a complex of machines and of herbicides and pesticides.

In the Summary Report of the CC CPSU to the 26th Party Congress comrade L.I. Brezhnev emphasized: "The first task is to increase the production of those types of agricultural output whose shortages give rise to especially tangible breakdowns

in supply. I have in mind above all meat and other animal husbandry output."

During the 10th Five-Year Plan scientific institutions made a definite contribution to the development of animal husbandry. A number of effective selection methods were proposed. Six breeds, 13 types, and 83 lines of agricultural animals were raised. Research was carried out on the optimization of animal feeding, the technology of preparing feeds and increasing their nutritional value, ration balance, and the creation of new combined feeds. Real results were also obtained in the scientific substantiation of industrial technologies for the production of animal husbandry products. But for many directions science is lagging behind the needs of production: the accomplishment of many important tasks is being delayed, and the results of research are being introduced into practice slowly.

During the 11th Five-Year Plan and, for the future, until the year 1990 all of the branches of animal husbandry will develop on the basis of intensification and industrialization. In view of this, scientific institutions have to provide production with the most effective methods and technologies of conducting animal husbandry.

In accordance with the special-purpose overall scientific and technical program, it is necessary to strengthen research in three basic directions: the genetic improvement of agricultural animals, the rationalization of feeding, and the creation of effective technologies for the production of animal husbandry products. Selection has to be directed toward creating animals which combine a high genetic productivity potential with high adaptability to present industrial technologies. The methods of large-scale selection have to become widespread in dairy cattle breeding, sheep breeding, swine breeding, and other branches of animal husbandry.

It is necessary to accelerate the introduction of research results on animal genetics and breeding into the practice of breeding work in which selection centers have a decisive role. Both scientific workers and practical breeding workers have to be members of the collectives working on the single overall programs for the creation of new breeds. This will produce a good result. Substantial efforts by selection specialists should be concentrated on developing breeds, types, and lines of specialized meat cattle. Meat cattle raising is developing poorly in our country and the task of scientific institutions is to rapidly create a present-day breeding base so that in the future there will be a substantial increase in the production of meat in the specialized branch of meat cattle raising. While working on the creation of new breeds and types of animals, the improvement of existing ones from which we obtain our basic output must not be weakened. For this reason, it is necessary to continue to improve intrabreed selection and to actively introduce its methods into production.

It is generally known that the decisive factor in ~~increasing~~ the productivity of animals is an optimization of feeding, which makes it possible to realize their already created genetic productivity potential. A lack of balance in rations in protein and in irreplaceable amino acids leads to a substantial overexpenditure of feeds and sharply reduces the efficiency of animal husbandry. For this reason, it is essential to substantially expand research and development work on feed

production and the feeding of animals and on the physiology and biochemistry of digestion and metabolism. Especial attention has to be directed toward these problems by the All-Union Institute of Feeds imeni V.R. Williams and the All-Union Institute of the Physiology, Biochemistry, and Nutrition of Agricultural Animals.

During the 11th Five-Year Plan research on new technologies has to be expanded. Production is in need of such technologies as will reduce labor expenditures per unit of animal husbandry output by two-three times. A definite stock of experience exists and it is now necessary to disclose bottlenecks, carry out additional research, and in cooperation with planning and designing organizations create new plans for more economical farms and complexes which ensure high productivity, the safeguarding of the health of the animals, and a sharp increase in labor productivity. Expenditures for the construction of animal husbandry facilities have to be sharply decreased. In creating new technologies practical animal husbandry workers have to be enlisted as early as the planning stage so as to speed up the introduction of scientific achievements into production.

The fulfillment of the special-purpose overall animal husbandry programs depends to a large extent upon how effectively the health of the animals will be protected. The creation and introduction of reliable methods of preventive medicine and of fighting livestock and poultry diseases and a decrease in losses from cow barrenness and mastitis will be an important reserve for increasing the production of animal husbandry products.

During the 10th Five-Year Plan a good situation was achieved in animal husbandry with regard to the most dangerous infectious diseases and their incidence in all types of farm animals was reduced. Practice had introduced into it 190 of the most important scientific development projects, many of which are unique and do not have analogues abroad. For some of them licenses have been sold and patents obtained. However, the development of industrial animal husbandry requires increased research in veterinary science. We have to have stable veterinary health in our animals and poultry in all technologies. It will be necessary to find and introduce zoo-hygiene norms which meet the biological requirements of livestock which is maintained on large farms and industrial-type complexes.

It is necessary to increase the struggle against sterility and to expand the search for a stimulant of fertility for farm animals in order to obtain 95-100 calves and 120-140 lambs per 100 producers, and 22-23 piglets per basic sow. It is necessary to speed up the universal introduction of a progressive flow-line shop system in dairy animal husbandry which improves the reproduction of the herd and the preservation of healthy offspring.

The specific character and seasonal nature of agricultural work and its dispersion results in the fact that in agriculture it is necessary to have 1.5-2 times more energy per unit of labor than in industry. Despite the major successes in this work, the actual energy supplies on kolkhozes and sovkhoses are less than in industry. For this reason, it is necessary to find ways to make fuller and more intensive use of existing energy equipment. There have to be intercoordinated solutions of the problems of strengthening the material and technical base,

power engineering, providing for the overall mechanized flow-line production of the basic agricultural crops, and increasing the qualifications of engineering and technical and mechanization cadres.

It will be necessary to create tractors and trucks with an increased unit capacity and transportation equipment which makes more economical use of fuel and is adapted to diverse conditions. The village needs reliable machines with a greater range of working speeds, wide-grab and combined units for the cultivation of all crops, and harvesting equipment with a large capacity and high reliability and work quality. It is necessary to increase the freight capacity and maneuverability of agricultural transport, and to create specialized transportation and loading and unloading equipment and replaceable chassis and containers. Transportation services for agricultural technologies and flow-line production operations have to be improved more boldly. And an optimal combination of truck and tractor transportation for the kolkhozes and sovkhozes has to be determined.

Production efficiency and the creation of the best working conditions is based on the development of rural electrification, especially in animal husbandry. But its level is still clearly insufficient. In view of the limited stocks of non-renewable sources of energy and agriculture's ever increasing need for it special attention should be directed toward the development of energy saving technologies.

The development of industrial technologies, a minimization of soil cultivation, and the combining of operations in crop cultivation--all of this will substantially decrease the number of tractor passes. Energy saving technologies should develop above all during feed preparation, the drying of grain and other cropping output, and also in animal husbandry. Besides on the basis of new technological solutions, the efficiency of energy engineering increases with an improvement of machine and tractor pool operations systems, planning methods, and overall deliveries of new equipment to agriculture.

The goal is now being set of not merely creating energy equipment or machinery, but of developing and producing complexes for modern technologies. We must orient ourselves toward the creation of the equipment and technology of the future. The fact that only a single license has been sold for mechanization equipment indicates the low level of the work of our mechanization and electrification institutes. More than 80 percent of the machines which were created during the past five-year plan and developed or modernized on the basis of traditional schemes do not introduce any fundamental changes in the technologies being carried out or in labor expenditures.

The mastery of new equipment and the introduction of fundamentally new technologies goes on for eight to ten years and it is now that a scientific search must be widely developed for fundamentally new technological solutions, equipment, and automation systems which increase labor productivity by two to three times. This requires close collaboration with the head designing bureaus and plants of industry and, above all, of the system of the USSR Ministry of Agricultural Machine Building and the USSR Ministry of Machine Building for Animal Husbandry and Fodder Production. Together with the USSR Academy of Sciences it is also necessary to develop the basic promising directions of the use in agriculture of atomic and

renewable sources of energy, especially solar energy, wind energy, and the energy of geothermal waters. In a word, agricultural power engineering has to receive a substantially greater scientific development.

The problems of improving the organization of scientific research were considered at the 26th CPSU Congress. "This system," comrade L.I. Brezhnev said, "has to be much more flexible and mobile, and it is one which does not tolerate sterile laboratories and institutes."

In the light of these propositions an improvement of the management of agricultural science and of its organization is taking on increasing importance. Regional branches of the All-Union Academy of Agricultural Sciences imeni Lenin have been created in the basic soil and climate zones of the country, but a number of problems of the organization of agricultural science remain unsolved. The Presidium of the All-Union Academy of Agricultural Sciences believes that the time has come to regulate and concentrate the planning, coordination, and methodological direction of all scientific research work, its financing, material and technical support, the training and placement of scientific cadres, and also administrative direction in a single center. At present these elements are disunited. Even all-union head institutes with an agricultural specialty are subordinated to various ministries and departments. This creates difficulties for planning, coordination, and overall research on a country-wide scale, and is becoming a reason for the incomplete use of our scientific potential. It would be useful to increase the role of the All-Union Academy of Agricultural Sciences in managing the agricultural science of the entire agro-industrial complex, regardless of its departmental subordination. In our opinion, this will improve the quality of scientific research, promote the carrying out of a single scientific and technical policy, eliminate duplication, and will accelerate the solution of key national economic problems and the introduction of scientific development into production.

It seems to us that within the All-Union Academy of Agricultural Sciences there need to be head scientific research institutes which perform research on the basic problems of the development of agro-industrial complex. But for now it would be useful to create an interdepartmental scientific council at the Presidium of the All-Union Academy on the problems connected with the development of the agro-industrial complex. The function of such a council would be to coordinate the scientific work on all of the stages of the production of food, beginning with an increase in soil fertility and ending with finished food products. It would be desirable to include in the membership of the council, which has to be endowed with the appropriate authority, authoritative scientists and specialists who represent all of the ministries and departments of the agro-industrial complex.

Experience confirms the usefulness of coordinating scientific research both by branch and by regional principles. The All-Union Academy of Agricultural Sciences and its regional branches have to become the element which performs the basic functions of the planning, coordination, and methodological direction of the scientific research in the system of the agro-industrial complex.

There is still a great deal of formalism in the coordination of science. As a

rule, it is performed only at the concluding stage of work. It is necessary to shift to such forms of coordination in which there is the joint planning and performance of experiments, and coordination develops into research cooperation. We may take as an example the "Embriogenetika" joint program of the USSR Academy of Sciences and All-Union Academy of Agricultural Sciences in which researchers jointly plan and carry out experiments and discuss results and get a positive effect.

As the President of the USSR Academy of Sciences Academician A.P. Aleksandrov noted in his address at the 26th CPSU Congress, the coordination of science in our country is an extremely important party directive. The Presidium of the All-Union Academy of Agricultural Sciences imeni Lenin and its regional branches have to give paramount importance to this question. An important role in the coordination work belongs to the head All-Union Institutes which have been given the responsibility for the state and effectiveness of research in the country in the sphere of its specialization. The directors of the head institutes and of scientific collectives must constantly analyze the development of science, plan and create a scientific stock in the main directions, and see to it the coordination and the division of labor are effective. And many institutes put a great deal of effort into improving this work during the 10th Five-Year Plan. Good examples can be found in the All-Union Institute of Plant Protection, the All-Union Institute of Rice, and certain others.

However, not all head institutes have acquired recognition as leaders in their field. They bear a substantial part of the blame for the miscalculations and lagging of agricultural science in a number of directions. The Presidium of the All-Union Academy of Agricultural Sciences is undertaking a complex of measures to activate the work of the head institutes and to increase their responsibility for the level and fruitfulness of scientific research.

In recent years the connections between the All-Union Academy of Agricultural Sciences and the USSR Academy of Sciences and the republic academies have become closer. Wide public recognition has been won by the scientific work of the Siberian Branch of the All-Union Academy of Agricultural Sciences, the Siberian Branch of the USSR Academy of Sciences, and the Siberian Branch of the USSR Academy of Medical Sciences. There are examples of effective cooperation between the scientists of the USSR Academy of Sciences and the All-Union Academy and the republic academies in the Ukraine, and Central Asia, and in other regions. A good practice has developed of holding joint sessions and conferences of the USSR Academy of Sciences and the All-Union Academy on the most important problems of agricultural science and production. The session of the USSR Academy of Sciences and the All-Union Academy "Science for Agriculture," after which joint basic and applied research was greatly activated, was of especial importance. The all-union institutes of the All-Union Academy of Agricultural Sciences are collaborating fruitfully with the institutions of the USSR Academy of Sciences and of the academies of the CEMA member countries on the basic directions of the development of biological and agricultural science. These bonds have been growing stronger from year to year.

At the 26th CPSU Congress attention was directed toward an attentive attitude

toward the needs of science, providing scientific institutions with equipment and instruments, and expanding experimental production.

During the years of the 10th Five-Year Plan the capital investments which were assigned for the development of the material and technical base of the scientific institutions of the All-Union Academy of Agricultural Sciences exceeded 300 million rubles. However, many problems of material and technical supply for the Academy's scientific institutions are still being solved unsatisfactorily. The capital available to researchers in agricultural scientific institutions is substantially less than in other branches of science, which slows down the accomplishment of many tasks. The outfitting of agricultural science with modern instruments and equipment must be improved, and this will produce a rapid and substantial effect. At the same time, there are large internal reserves in scientific institutions whose activation will increase the fruitfulness of agricultural science. It is necessary to optimize the structure of a number of institutes and to unite small and uncoordinated subdivisions into collectives for the accomplishment of large overall tasks and the development of scientific output which is suitable for direct introduction into production. Institutes usually raise the question only of creating new subdivisions, but more attention should be devoted to increasing the effectiveness of scientific work by means of a more efficient use of workers and resources.

In science, as in any sphere of activity, success is determined by people. The 26th CPSU Congress demanded: "Improve the training and improve the qualifications and certification of scientific and scientific teaching cadres." The directors of the institutes and regional branches and the Presidium of the All-Union Academy of Agricultural Sciences have to raise the level of the training, education, and placement of scientific cadres; and to expand a mutual exchange of work experience. Successful results in science are determined not so much by the numbers as by the qualifications and creative energies of cadres. The energy of the young and the knowledge and experience of our scientists of the older generation have to be correctly combined. A more careful attitude has to be shown toward the training of our scientific replacements, especially since the influx of talented young people into science has increased. The situation is even more disturbing with the training of doctors of sciences the new numbers of which during the 10th Five-Year Plan decreased by 2.5 times compared to the previous five-year plan.

The potential of our vuzes which for a number of reasons is still being used inadequately has to be enlisted more widely into scientific research. On the basis of their numbers and qualifications our vuz scientists could make a substantially larger contribution to the solution of many important problems.

Present-day science is characterized by the collective work of the researchers of diverse specialties. The leaders of scientific collectives have to encourage this kind of cooperation. The labor of scientists is in need of regulation and organization. They have to be freed from uncharacteristic duties, their efforts have to be concentrated on research work, and they have to be supplied with service personnel and equipment and instruments.

A very important indicator of the effectiveness of science is the novelty of its results. Unfortunately, sometimes the efforts of collectives are expended on the solution of already solved problems. For this reason, it is important to organize more effective information on the achievements of Soviet and world science. It is necessary to strengthen patent and license work and to see to it that most research and development are crowned with inventors' certificates and patents. Every important step forward in science is connected with the appearance of new research methods. In this connection, the scientific institutions of the All-Union Academy of Agricultural Sciences have to be more active in developing new methods aimed at achieving substantial results.

We have to adopt as a constant guide to action the statement by comrade L.I. Brezhnev to the effect that "...the decisive and most acute sector today is the introduction of scientific discoveries and inventions. Scientific research and planning and designing work has to be joined more closely--economically and organizationally--with production.... Everything that makes the process of introduction difficult, slow, and painful has to be eliminated."

Definite work has been done in this direction in recent years, but the situation with the introduction of scientific recommendations cannot be regarded as satisfactory. The system and the procedure of introduction are in need of serious improvement, especially at the final stage--on farms and at enterprises. We scientists are often accused of the fact that we give production too few varieties and advance technologies and machines and do not work enough on introduction. And one must agree with this. For example, the very large "Shchapovo" dairy complex has been built in the All-Union Institute of Animal Husbandry. In recent years the productivity of the animals at the complex has been falling, but the institute's scientists have not taken sufficient measures to introduce scientific achievements here in order to correct the situation.

At the same time, frequently effective scientific developments do not find application because of the passivity of the workers of agricultural agencies and of specialists. The procedure for testing and introducing scientific developments and for drawing up documentation is so complex and multi-staged that the introduction period of finished technologies for new varieties and hybrids are dragged out for many years. This inflicts large economic damage upon the economy and is morally damaging to scientific development workers. The industrial ministries of the agro-industrial complex are also showing slowness in putting new machines into production and introducing more effective forms of fertilizers, herbicides, and toxic chemicals. This situation has to be seriously corrected through joint efforts. The functions and the duties of science and of the ministries with regard to introduction have to be defined more clearly.

The practice which has developed of evaluating scientific workers solely by the number of their publications does not promote an acceleration of the processes of introduction. It is necessary to strengthen the introduction subdivisions of scientific research institutions, to expand the joint work of research and planning and designing organizations, and to bring researchers more extensively into the popularization of scientific achievements. The successful introduction of a number of scientific development projects is connected with industrial tests, which,

given the lack of experimental bases and designing bureaus, are difficult to perform. There is an urgent necessity to organize experimental production at a number of institutes at which scientific institutions would make test models and bring development work to a suitable level for plant manufacture.

Scientific production associations have recommended themselves as an effective form of accelerating the introduction of scientific achievements into production. At them scientists, specialists, and workers work for the sake of a single goal--to place the achievements of science at the service of production and to achieve a maximum production of output with the least expenditures. During the 10th Five-Year Plan a number of agricultural scientific organizations were created and a work plan for the next few years was mapped out. The "Dnepr" scientific production association is being formed on the basis of the All-Union Institute of Corn, and the "Oil-Producing Crops" scientific production association is being created on the basis of the All-Union Scientific Research Institute of Oil-Producing Crops. It is planned to organize associations on the basis of the All-Union Scientific Research Institute of Pea Crops, All-Union Scientific Research Institution of Grain Farming, and the All-Union Scientific Research Institution of Rice. The leaders of the regional branches of the All-Union Academy of Agricultural Sciences have to activate the creation of scientific production associations on the basis of narrowly specialized and other institutes. The more quickly the scientific production associations are formed, the better the results that will be achieved in science and in production. Careful study and use should be made of the experiments of the scientific production associations of Moldavia where such associations as "Hybrid" and "Dnestr" produce major results.

The zonal institutes are a very important link which provide a close connection between science and production. As a rule, the research performed by them reflects the specific nature of a zone and is directed toward concrete practical tasks. The research results of these institutes should be rapidly tested at base farms and then introduced widely into production. The zonal institutes are the outposts of agricultural science which are most closely connected with practice. It is their collectives and their experimental stations which have the basic work load connected with the direct influence of science on the development of a zone's agriculture. The Siberian Scientific Research Institute of Agriculture whose work was highly praised at the All-Union Agronomy Conference serves as an example of effective work by a zonal institute.

Entering into the 11th Five-Year Plan, our agrarian scientists have to reveal reserves in all of the elements of their work and define the ways to make the most efficient use of resources in order to obtain a maximum final product. An intensive search for new ways to accomplish the tasks which have been set for agriculture is essential. Scientific research has to be distinguished by deep analysis, wide scope, systematic work, and by the promise of the problems being solved by it. Agrarian scientists will take the most active part in realizing the party's plans in the field of agriculture and will thoroughly promote the introduction of scientific achievements into agricultural production.

COPYRIGHT: Izdatel'stvo "Kolos," "Vestnik sel'skokhozyaystvennoy nauki," 1981

2959

CSO: 1824/472

IMPORTANCE OF ADHERING TO SOUND AGRO-ECONOMIC PRINCIPLES

Moscow VESTNIK SEL'SKOKHOZYAYSTVENNOY NAUKI in Russian No 8, Aug 81 pp 34-43

[Article by A. A. Nikonov, VASKhNIL academician: "Economics Should Be Economical"]

[Text] Intensification of the economy and its increased efficiency, to translate this formula into the language of practical actions, consists primarily in that the results of production increase more rapidly than expenditures on it and more is achieved with relatively fewer resources. Planning and the scientific-technical and structural policy can serve to solve this problem. Methods of management and the policy in the area of administration should promote efficiency . . . the economy should be economical--such is the requirement of the time.

L. I. Brezhnev

The economic strategy of the 1980's occupied a prominent place in the work of the 26th CPSU Congress. The report of Comrade L. I. Brezhnev and the documents adopted by the congress gave an objective evaluation of the changes that took place during the 1970's and scientifically substantiated the main directions of the economic policy for the current decade. All-around intensification and increased efficiency of utilization of resources constitute its essence, its core.

The party's agrarian policy is a most important constituent part of the overall economic policy. In addition to traditional trends--intensification and efficiency--it includes newly formulated tasks. They include the food program and the development of an agro-industrial complex as a unified, integrated, balanced production system. Successful implementation of the food program, like the creation of the gradually developing agro-industrial complex, is possible on the basis of economical and efficient utilization of all production resources.

It was noted at the 26th CPSU Congress that, as compared to the best world indicators, we still lose a great deal of raw material and energy per unit of national income. This demonstrates the possibility of increasing the output of the final product with existing resources. This point pertains fully to agriculture as well. Here certain economic indicators even decreased during past years as compared to the second half of the 1960's (Table 1).

Table 1. Dynamics of Several Agricultural Production Indicators, % (1966-1970--100)

Indicator	1966-1970	1971-1975	1976-1980
Value of gross agricultural output in comparable prices of 1973; all categories of farms	100	113	123
Public sector	100	117	132
Production outlays	100	147	195
The same, in comparable prices	100	122	144
Average annual value of fixed pro- duction capital for agricultural purposes	100	167	265
Total of capital investments in production facilities for agri- cultural purposes	100	165	210

From the figures presented it is clear that outlays are increasing more rapidly than production volumes. Thus while the average annual rate of increase of the gross output in the 1970's--more precisely, in comparison to its indicators under the Tenth and Eighth Five-Year Plans--amounted to 2.85 percent in the public sector, the outlays annually increased by 6.95 in current prices and 3.70 percent in comparable prices. While under the Eighth Five-Year Plan 70 rubles were spent per 100 rubles of gross output and under the Ninth Five-Year Plan 88 were spent, under the Tenth Five-Year Plan more than 100 rubles. In comparable prices these figures are 80, 83 and 87 rubles, respectively. These are the average indicators for the country. In individual regions and republics the increase of production volumes outstrips the increase of outlays (in comparable prices) per unit of output. In Azerbaijan per 100 rubles of gross output under the Eighth Five-Year Plan expenditures amounted to 85 rubles, under the Ninth--76 and under the Tenth--64 rubles; in Estonia these figures were 83, 78 and 75 rubles, respectively. The same tendency is typical for Lithuania, Georgia, Armenia and several other regions of the country. The relatively favorable ratio in the "expenditure-output" system was achieved here through more efficient utilization of resources, fairly high rates of increase of production volume and skillfully arranged economic work.

It is generally known that economic processes are very complex, and one cannot simplify them. But still the significant slowing of the growth rates of production in the 1970's as compared to the second half of the 1960's, the increased outlays per unit of output, the reduced profitability and increased quantity of farms operating at a loss, the rapid increase of credit indebtedness and other negative phenomena cannot but alarm and worry us. The decisions of the 26th Party Congress not only call for overcoming these tendencies, but also show ways of solving this complicated problem. The main things here are to economize on resources, to utilize them efficiently, and to increase the efficiency of intensification.

Large progressive changes are taking place in modern agriculture. Their essence consists mainly in steady industrialization of production and the development of interbranch technological and other ties with branches that comprise the country's whole agro-industrial complex. Large qualitative changes have taken place and become appreciable in a relatively short period of time, since the second half of the

1960's. They are reflected, particularly, in the constant reduction of the proportion of live labor with a simultaneous increase in the proportion of embodied labor (Table 2).

Table 2. Ratio Between Live and Embodied Labor in Public Sector of USSR Agriculture, %

Indicator	1966-1970	1971-1975	1976-1980
Live labor	47	40	36
Embodied labor	53	60	64

A reduction of the proportion of payment for labor in the expenditures per unit of output, with a simultaneous increase in earnings, is accompanied by a reduction of the labor-intensiveness of production. This is a positive process. Direct labor expenditures per unit of all kinds of agricultural products have significantly decreased. In sovkhos poultry raising this indicator is at the level of the most developed countries of the world.

According to calculations, direct labor expenditures per unit of output have decreased by 44 percent in agriculture during the past 15 years. But still in many of its branches we continue to expend a very large amount of live labor and, in terms of this indicator, we are far behind certain developed countries of the world.

And the total outlays, not in labor, but in value terms per unit of output, are increasing, and mainly as a result of material expenditures (Table 3).

Table 3. Production Outlays per Unit of Gross Agricultural Output, %, in Current Prices (1966-1970--100)

Indicator	1966-1970	1971-1975	1976-1980
Total	100	126	149
Including payment for labor	100	106	112
Material expenditures	100	143	181

Hence arises the primary task--to expend material resources more rationally, just like all other resources. Comrade L. I. Brezhnev set the task ". . . to decisively increase the effectiveness of the utilization of the land, especially reclaimed land, machines, fertilizers, feeds" It is the duty of scientific institutions to substantiate methods of efficient utilization of resources and to arm practical workers with them. Based on the decisions of the 26th Party Congress, resources must be regarded in the broad understanding, that is, including labor, land, water, energy, material-technical, financial, biological and bioclimatic resources. And before giving suggestions about ways of saving on them in agriculture, one should briefly discuss the current state of their utilization.

Labor reserves and the availability of a labor force cause special concern. There will be no influx of labor into agriculture in the foreseeable future. Even now many regions are experiencing a critical shortage of labor resources. The entire increase of production in agriculture has long been achieved only through increasing labor productivity while reducing the number of workers. In individual periods,

for example, under the Eighth Five-Year Plan, the average annual rate of increase of labor productivity was extremely high, reaching 5.4 percent. It decreased somewhat in the 1970's.

During a year one worker in the public sector of agriculture produces products in the amount of 4,000 rubles (3,975 rubles during 1976-1979). But there are essential deviations from this in the various regions of the country and branches of production. Thus in the Estonian SSR this indicator is 8,494 rubles and in the Lithuanian SSR—5,163 rubles.

The situation is the same with hourly output. During the years of the Tenth Five-Year Plan it amounted to 2.14 rubles per one man-hour of a worker in the branch, with the same sharp differences among the various republics. While in Estonia 4.23 rubles' worth of products are produced per man-hour, in Tajikistan it is only 1.3 rubles, or one-third as much. The average hourly output for the country in physical terms amounts to 18 kilograms of grain units. In the past this indicator could have been considered to be very high—more than a pood of grain per hour. Under modern conditions, with the rapidly increasing outlays, funds, power availability and other objective conditions, this level should be considered inadequate for an economically developed country. An analysis of statistical data show that direct labor expenditures in grain farming are 3-4 times higher than in certain foreign countries. Of course the country already has agricultural enterprises where labor productivity is no lower than world standards, but there are not many of these farms so far.

All this shows that there are possibilities of significantly increasing labor productivity and that there are large reserves. On the other hand, the objective situation with labor resources dictates a critical need to sharply increase labor productivity. Working time can be utilized much more productively. In this area we must develop technical and technological thought, implement social, economic and organization measures, and introduce scientific organization of labor.

The productivity of the land is steadily increasing and the output of products from each hectare is increasing from five-year plan to five-year plan. Thus under the Seventh Five-Year Plan (1961-1965) the value of all products obtained from each hectare was 136 rubles, under the Eighth—165, under the Ninth—187 and under the Tenth—204 rubles. Thus during the past fifteen years the output of products in comparable prices per unit of land increased 1.5-fold.

The many years of practice of the leading farms and regions show the great possibilities of increasing the productivity of the land. But still any comparisons can give only an approximate picture since we do not yet have a land cadaster for the entire territory. It is possible to speak about the complete or incomplete utilization of the potential capabilities of one field or another only if one has an all-around evaluation of each of them in comparable quantities. The only way one can draw substantiated conclusions and evaluations is if on one farm per one point of the cadaster hectare one quantity of output is obtained, and on another a different is obtained with all other resources being equal. But so far, unfortunately, we have no such objective criterion. A cadaster is necessary and it is extremely crucial to introduce one.

Our country's agricultural production is carried out on an immense territory which includes 606 million hectares of agricultural land. The enterprises are located in various geographical belts with various climates, with various kinds of soil, at various altitudes above sea level, with different reliefs, and with different supplies of water and nutritive substances in the plowed layer of soil, not to mention the different economic and demographic conditions. These differences are not secondary, but of decided importance. The appropriate methods should take note of them and reflect them in the evaluation of the efficiency of production. Practice convincingly shows that the output of products per hectare can be consistently increased, but this requires additional outlays with an optimal correlation of elements of expenditures.

The limited area of land and the fact that the per capita area is steadily decreasing leaves no other way than intensification, to which there are no alternatives in modern farming. This is why it is so important to find the optimal combination of factors of intensification for each variant, in order to increase the yield with relatively fewer outlays.

Chemization in general and the application of fertilizers in particular are a powerful means of increasing the yields of crop growing products. The USSR has created the largest fertilizer industry in terms of production volumes. The application of fertilizers is steadily increasing. Thus in 1960 12.2 kilograms of effective substances were applied per hectare, in 1965--28.4, in 1970--46.8, and in 1975--77.5 kilograms.

The society is investing immense amounts in the construction of chemical enterprises, and they are fairly expensive. The supplies of mineral raw materials, especially phosphorus, are limited. The farms' outlays on chemization are also increasing: since 1965 they have increased almost 5-fold and now amount to 3 billion rubles. Taking all this into account, it is necessary to achieve a high return from fertilizers. Agro-chemical science has methods of effectively applying them. But the facts show something different: in a number of branches and republics the utilization of fertilizers is increasing, but the yields are not. One can refer to the indicators of Orlovskaya Oblast (Table 4).

Table 4. Utilization of Mineral Fertilizers on Grain Crops on Farms of Orlovskaya Oblast.

Indicator	1966- 1970	1971- 1975	1976- 1979	1976-1979 % of 1966-1970
Fertilizers applied to grain crops (not including corn), thousands of tons of active substance	29.1	40.3	58.9	203
Gross grain production, thousands of tons	1271	1463	1324	104
Productivity of grain crops, quintals per hectare	31.4	14.4	12.4	93

Of course the overwhelming majority of farms and regions apply fertilizers effectively. Chemization, in addition to other measures, has made it possible, for example, to increase productivity steadily in Belorussia. The harvest of grain crops here has increased from 13.1 quintal per hectare during the years of the Eighth Five-Year Plan to 22.7 under the Tenth (1976-1979), and potatoes--from 140 to 169 quintals per hectare, respectively. Experience shows that a low return is usually explained by a violation of the comprehensiveness and systematic nature of the application of means of intensification: the ratio of nutritive substances is not always optimal, fertilizers are applied to acid soil, chemization is not reinforced by an advanced science of farming and technological discipline, and so forth.

As agriculture becomes more intensified it consumes more and more extracted energy including liquid fuel. The expenditures of this by the kolkhozes and sovkhoses increased under the Tenth Five-Year Plan almost 4.2-fold as compared to the Eighth, which explains to a considerable degree the change in prices of petroleum products. But the physical volumes of consumption of energy are also increasing. Taking into account the limited amounts of mineral energy resources and also the objectively conditioned increased value of these kinds of energy, it is necessary to utilize them extremely economically and efficiently. The gross agricultural output per one ton of expended liquid fuel is 2,070 rubles. These expenditures are approximately 40-50 percent higher than in certain industrially developed foreign countries. So there is a possibility of expending energy more economically. The designing of machines, the organization of the utilization of technical equipment, production technology and the system of incentives for workers should be directed toward all-around economizing on energy resources.

Feeds take up a very large proportion in the structure of production outlays, comprising 39 percent of the value of all material expenditures on animal husbandry products. Although this indicator is decreasing somewhat, the absolute volumes are increasing. Today feed has become a most important condition for increasing the productivity of animal husbandry. The quantity of feeds is inadequate, and their quality is poor.

The expenditure of feeds per unit of output on the farms is fairly significant. During the years of the Tenth Five-Year Plan 1.5 quintals of feed units were expended per one quintal of milk, and per one quintal of weight gain of large horned cattle--12.6 quintals of feed units and hogs--8.7 quintals of feed units. In individual republics and oblasts the expenditures on the production on a unit of output are much higher than the average level. And, conversely, in the Estonian SSR they obtain a quintal of milk with only 1.1 quintal of feed units, beef--8.3 and pork--5.7 quintals of feed units. The farms of this republic have developed and are manifesting a traditionally thrifty attitude toward all production resources, and scientific collectives are doing a great deal in this area. Here the work is done everywhere with rations that are balanced in the main nutritive substances, especially protein.

It is recognized that agricultural production is based on the utilization of living organisms--plants and animals--which are objects, and sometimes also implements of labor. The degree of utilization of their potential productivity depends on many factors, and these issues require special consideration. Here one can note that the coefficient of the utilization of the genetic capabilities is not high, especially in crop growing although selection work has produced strains and hybrids of

high productivity. But still there is progress in crop growing and the average yields for the country are increasing. The situation is more complicated in animal husbandry, mainly in dairy farming, where the productivity is increasing extremely slowly. Thus the average milk yield per cow in 1965 was 1,853 kilograms, in 1970--2,110, in 1975--2,204 and in 1980--2,223 kilograms. Of course, in increasing productivity much depends on selection, but most of the blame lies with feeding and technology. All these are links in one inseparable chain.

The volume of capital investments in agriculture for the entire complex of work is increasing from five-year plan to five-year plan. While in the 1960's 130 billion rubles were allotted for these purposes, in the 1970's this amount was 300 billion. This has significantly strengthened the branch's material and technical base and made it possible to carry out large land reclamation projects and for farms to acquire a good deal of technical equipment and erect production facilities. Still the return from the investment could have been higher, taking into account their exceptionally large scale. The increase in the volumes of production have proved to be less than was earmarked by the plans. What is the reason for this? What must be done for a higher return on investments and capital?

The funds that were allotted were devalued to a certain degree because of the increased costs of technical equipment, materials, work and services, that is, everything that is produced in branches of industry and the sphere of production services and is consumed in agriculture. But it is not only and not so much a matter of this. The significant reasons consists in the various disproportions and imbalance in the structure of the material and technical base both of agriculture itself and of the entire agro-industrial complex. And this leads to violating the comprehensiveness and systematic nature, to dispersion of funds and interruptions, to separation of parts from the unified whole, for example, overall technology and organization of production of one product or another, and to the appearance of ruptures in the unified chain. The existing structure for control of production both in agriculture and in the agro-industrial complex as a whole also lacks wholeness, and the effect of economic and social factors is weakened. The fact is that control is dispersed, and each branch pursues its own economic interests which do not always coincide with the common ones. Moreover, the consumer of the products and services has little influence on the producer and supplier, especially of means of production. Incentives are not always directed toward ensuring high final results, and are limited only to intermediate ones.

Obviously, in order to have a greater return from investments and functioning funds and more effective inclusion of all resources in production, it is necessary to strictly observe certain principles. One should include among them: wholeness or comprehensiveness, proportionality, the utilization of norms, expediency and effective administration.

Wholeness or comprehensiveness presupposes complete supply of production with all kinds of resources necessary for carrying out the task set for it. This point seems obvious, and any other approach is illogical and absurd. But in reality there are frequent violations of the whole approach. Agricultural practice is filled with such contradictions. One must not forget that modern agriculture cannot continue to increase production volumes without the necessary investments in the form of nutritive substances in the soil, energy, more modern implements of labor, and skilled personnel who are motivated by the final results.

The main reason for the low return from investments and resources should be fought primarily in violations of wholeness. After all, we know of numerous cases where large investments in animal husbandry complexes are simply lost because of failure to observe wholeness: walls are constructed and there are not approaches to the structure, no residences are constructed for people, no adequate feed base is created, animals are not prepared for new technology, and the equipment does not have the necessary parts to go with it. There are also cases where everything is available except for one factor, for example, skilled workers, but this is enough to keep the industry from reaching assigned capacities.

Sometimes one important component of some kind of overestimated, for example, it seems that a new strain is capable of bringing about a revolution in farming. And it actually could lead to a qualitative leap in increasing productivity if all necessary components are guaranteed: fertilizers, water and air conditions, technology and technical equipment. So in order to obtain a full return on investments and resources it is necessary to provide the entire set of components, including the most insignificant ones.

Proportionality requires the observance of certain quantitative proportions among individual production elements in each case, and a certain structure. One cannot ignore the actual laws of minimum and optimum in crop growing and animal husbandry. One can, for example, increase the contents of nutritive substances in the soil several fold, but one cannot obtain a return in the yields if one does not maintain a correct ratio among them. If there is a minimum of phosphorus in the soil and an adequate dose is not applied, it will determine the amount of the yield.

And overexpenditure of feeds in animal husbandry takes place primarily takes place because of a shortage of digestible protein in the rations, and an overexpenditure of grain in the mixed feed industry results from a shortage of other necessary components. Power machinery is utilized inefficiently because it is not supplied with a complete set of working parts. Fixed capital is recouped slowly because of an inadequate supply of circulating capital. The very structure of the fixed production capital has taken form in such a way that the proportion of active elements (machines, power and transportation equipment, productive livestock) is lower than optimal, and recently it has shown a tendency toward reduction.

Obviously, it is more expedient to direct capital investments to places where there are "bottlenecks" which impede the overall development of production and the fulfillment of the tasks that have been set. They now include the social and production infrastructure, roads, storehouses, fertilizers, fertile soils, feeds, and full sets of equipment. But if one considers the agro-industrial complex as a whole they include transportation, storage, processing and sales of products. The largest losses of products are now to be found in these areas, and this reduces the output of the final product and devalues labor invested in the fields and farms. Therefore proportionality should be observed at all levels: interbranch, branch and enterprise.

The utilization of norms envisions the application of specifically substantiated norms for expenditure of resources on the production of each unit of output or work. Norms should be progressive and based on data from science and advanced practice. But they should also be realistic and differentiated, taking into account regional and branch peculiarities. Norms can be expressed in physical and value indicators,

there can be interbranch and branch norms, and norms that are calculated for long-term and current planning. Only on the basis of scientifically substantiated norms is it possible to balance the elements of production at all levels: enterprises, associations, branches and the agro-industrial complex.

In agriculture it is extremely important to have norms for the consumption or expenditures of labor, land, water, seeds, feeds, fertilizers, fuels, processed materials, technical equipment, facilities and financial funds. At the interbranch level as regards the agro-industrial complex, norms should be developed for the needs per unit (thousand, million) of produced output, capital investments, energy supplies, roads, storehouses, means of transportation, processing enterprises and raw materials; and per thousands residents--norms for facilities of the social infrastructure.

Failure to observe economically substantiated norms and raising or lowering them lead to inefficient utilization and squandering of resources. Thus underfeeding leads to incomplete realization of the genetic potential of the animals and overexpenditure of feeds per unit of output. The actual provision of the livestock is 27-28 quintals of feed units per head instead of the optimal 38-40 quintals of feed units per year. This explains to a certain degree not only the low productivity of dairy cattle, but also the fact that dairy animal husbandry regularly operates at a loss. Increasing planning norms leads not only to decreased productivity, but also to an overexpenditure of grain. An inadequate supply of storehouses and refrigerated capacities leads to large losses of potatoes, vegetables, fruits and other products. Violation of the norm for facilities of the social infrastructure is becoming the main reason for the increased migration of rural population to the cities and rayons with more favorable living conditions.

The development of norms is especially important both for planning and for administration of the economy as a whole. It is generally unthinkable to have intelligent and economical management without a good normative base. These problems should be handled by both economic and technological scientific institutions--union, republic and regional. The norms should be regularly updated since scientific and technical progress is dynamic and any of its achievements are reflected in the consumption norms of one resource or another. The degree of intensiveness and the assimilation of industrial technology are also important here. When substantiating norms it is necessary to take into account the topography, hydrology, and soil, climate and other natural conditions.

Expediency is understood as the concentration of the necessary resources on the solution to a specific problem, taking all objective conditions into account. Expediency is reflected in comprehensive target programs which not only set goals and tasks, but also indicate all resources, methods and forms of administering them. At the present time various comprehensive target programs are being prepared: "grain," "feed," "sugar," "meat," and "milk." These programs can be multilevel and hierarchical, and they can be developed for the country, republic, oblast, rayon, association or enterprise. But they are all comprehensive, embracing the totality of interconnected technical, technological, organizational, economic and social problems. And they all have a goal, they are directed towards solving a specific problem.

Systems for conducting agriculture occupy a special place among comprehensive target programs. They are whole, hierarchical and dynamic, and they have a certain structure as well as internal and external ties. The system for conducting agriculture embraces the entire totality of branches with their technological, economic, legal and other ties, and they evaluate labor, land, water, energy, material-technical, bioclimatic, plant, animal and other resources, and they also administer them for a certain level of production (enterprise, association, rayon, oblast, kray, republic). The system for conducting agriculture acquires the form of a system of interconnected models in their unity. It can be called a "super program" with respect to all branches and product programs. Since modern systems for conducting agriculture cannot but reflect ties with other branches of the agro-industrial complex and also with the production and social infrastructure and demographic factors, these systems acquire an interbranch nature.

Under modern conditions technologies must be approached in a new way, evaluating them in two aspects: first, so that they save on resources (labor, energy and material resources, soil protection resources, and so forth) and, second, so they quickly observe technological discipline. The second condition is of immense importance in agriculture because plants and animals are responsive to time periods and norms for the introduction of one resource or another--water, fertilizers or feeds. If one misses the optimal time period or deviates from the optimal norm, it is impossible to make up for losses subsequently. Therefore efficient control of technological processes, like control in general, acquires primary significance.

Administration can be effective only with the utilization of all methods, including economic, organization, social and psychological. Since the problem of expending resources is multifaceted and complex if only because the resources themselves are varied and require a differentiated approach, one cannot be limited to any one method of administration.

Planning has always been considered to be the main unit in administration. Even now it occupies a leading position in the system of administration. It should be arranged on the basis of normatives and balances.

The structure of administration should be improved in connection with the preparation and implementation of such large target programs as the food program, and it should be perfected both at the branch and at the interbranch level. It is important to skillfully combine the branch principle with the territorial principle, to maneuver resources flexibly and to observe wholeness. Obviously, in order to reveal the best structures it is necessary to conduct large production experiments at all levels, but especially at the rayon and oblast levels. Such large measures as scientific organization of labor, economically substantiated specialization and cooperation and agro-industrial integration contribute to efficient utilization of resources.

The organizational structure should be combined with the economic mechanism, consistent implementation of autonomous financing relations and justified prices. Economical and efficient expenditure of resources should be materially motivated, and the appropriate sanctions should be applied in the event of overexpenditures. These issues are clear in principle, but they are not always realized effectively enough in life.

In turn, economic measures should be reinforced with moral and psychological ones: encouragement for thrifty and economical expenditure of raw material; sanctions against carelessness and lack of discipline. The essence lies not so much in the degree of the sanctions as in the creation of a spirit of irreconcilability to any mismanagement. Not a single good or bad action, success or mistake, achievement or omission can go unnoticed; there must be a prompt public reaction to everything. The creation of a healthy psychological climate, a creative and businesslike situation and a spirit of competition and mutual assistance largely decide the fate of the production.

It is known that the success of any business depends on the competence and responsibility of people at all levels, from the field tractor driver and the animal husbandry operator or leader of the local labor collective to the manager of the large association or enterprise. Therefore it is necessary to constantly teach the workers of all occupations and all ranks, to teach them economics and methods of economical business. This takes many forms in our country. Now it is important to activate the network of economic training.

The implementation of the tasks set forth by the 26th CPSU Congress will take not one year, but an entire decade. These tasks are truly immense and difficult, but they are gratifying. Their implementation is vitally necessary for all Soviet people, our entire nation.

COPYRIGHT: Izdatel'stvo "Kolos", "Vestnik sel'skhokhozyaystvennoy nauki", 1981.

11772

CSO: 1824/473

AGRO-ECONOMICS AND ORGANIZATION

ORGANIZATION, STRUCTURE OF AGRO-INDUSTRIAL (FOOD) COMPLEX FOR ESTONIA

Tallinn KOMMUNIST ESTONII in Russian No 7, Jul 81 pp 46-52

[Article by M. Bronshteyn, corresponding member of the Estonian SSR Academy of Sciences: "On the Organizational and Economic Structure of the Republic Agro-Industrial (Food) Complex"]

[Text] The Need for Organizational and Economic Structuring of the Complex

Improving the organizational structure and administration of the agro-industrial complex is of special importance for implementing the food program that was developed in accordance with a decision of the CPSU Central Committee. In the accountability report at the 26th party congress, Comrade L. I. Brezhnev pointed out that "improving the organizational structures of control cannot be a half measure. One cannot adapt the living, developing organization of control of the economy to stagnant, customary forms. On the contrary, the forms must be brought into line with the changing economic tasks."

The formation of agro-industrial complexes at all levels reflects the objective process of further collectivization of production on the basis of the development and deepening of technological, organizational, economic and social ties between agriculture, branches of industry and the industrial and social infrastructure. This is conditioned by the need to provide the country with a reliable supply of food and agricultural raw material through better utilization of existing resources.

Study of the tendencies in the development of productive forces and technical-technological, economic and social ties shows that in agriculture and the spheres that provide it, under the conditions of our republic, production-social complexes take form at three levels.

1. The local agricultural region (group) which includes (2-5) farms that are joined together by production and social interests. Here it is possible to have a certain amount of development of interfarm specialization and cooperation, the creation of joint shops for producing feeds, warehouses, storehouses and so forth. It is especially important to combine the efforts of neighboring farms for the development of the social infrastructure, construction and expansion of modern villages with a complex for social and cultural services.

2. The rural rayon as the basic territorial unit where the local level of the agro-industrial complex takes form with its production and social ties among agricultural enterprises and enterprises that serve them--the rayon Goskomsel'khoshtekhnika association, construction organizations, dairy combines, transportation enterprises, and so forth.

3. The republic level of the agro-industrial complex, which embraces specialized ministries, associations and services of republic significance, and also rayon territorial units that are related by production and delivering to the consumer foodstuffs and industrial products made of agricultural raw material. This is the level at which it is possible to achieve the most efficient combination of territorial and branch control of the complex with a total program approach which is oriented toward the final result, with all the constituent parts of the complex being responsible and taking initiative.

Integration processes must develop in correspondence with the territorial and industrial-social complexes that objectively take form--interfarm, branch and interbranch associations are created, and also the system of planning and autonomously financed control improves. Taking into account the complexity and the newness of the task and the need to create production, economic and social prerequisites, the republic is carrying out this work in stages and conducting the appropriate experiments.

The Vil'yandiskoye experiment began in 1975. Its essence consists in the organizational and economic structuring of local territorial levels of the republic agro-industrial (food) complex. The experiment has been justified. The combination of agricultural and service enterprises of state and kolkhoz-cooperative sectors, while retaining their independence and economic initiative, partial centralization of resources of farms and organizations that are included in the association, the possibility of economic maneuvering respective of departmental and local barriers, the development and implementation of an all-embracing and balanced program for industrial and social development in the rayon, the deepening of interfarm specialization and cooperation, and the strengthening of backward units and farms--all this has made it possible, in the final analysis, to utilize existing resources more efficiently and to achieve higher production and social indicators. Under the Tenth Five-Year Plan the Vil'yandi agricultural association increased production by the following amounts as compared to the average annual level of the preceding five years: grain--by 39 percent, milk--by 21 percent, and meat--by 38 percent, including pork--by 60 percent. A second rayon agro-industrial association was created in the Estonian SSR in 1979--the Pyarnuskoye. In a short period of time it maneuvered resources effectively enough so as to bring up the backward farms and units. The rayon took over first place in the republic in terms of the results of economic activity last year, and it was also the winner of the all-union socialist competition. Similar rayon agro-industrial associations are functioning successfully in the Latvian and Georgian SSR's as well.

At the present time the Vil'yandiskoye experiment is expanding and other rayons of the republic are changing over to the new system. There is no doubt about the expediency of this. But it is impossible to resolve on the rayon level all problems of balanced and intercoordinated development of the agro-industrial complex, and

optimal combinations of territorial and branch administration. Serious difficulties arise because of the fact that the republic agro-industrial complex has not been structured organizationally and economically--its constituent parts do not have common administration agencies or a unified long-term program for the development or economic funds for providing for interbranch and spatial maneuvering in order to utilize more effectively financial, material and labor resources. The planning indicators and incentives that are currently in effect in individual parts of the agro-industrial complex do not orient the latter toward the final results of the entire complex with reduced expenditures of resources per unit of output. Moreover, if one takes into account that resources are becoming more and more limited and that they are being used for other important national economic problems, the problem of increasing the return from capital investments in agriculture and the agro-industrial complex becomes a most important one, which determines the rates and time periods for the implementation of the food program as a whole.

Certain structural changes must be made in order to increase the effectiveness of investments. This was discussed by Comrade L. I. Brezhnev at the November (1979) Plenum of the CPSU Central Committee: "Under the future five-year plan it will be necessary to make large changes in the structure and proportions of the economy, to improve the existing branch and territorial ties, and to reveal those units where, with minimal expenditures, it will be possible to obtain the greatest and most rapid effect." The latter is especially important for increasing the final effectiveness of the food complex. Weak links in its chain are cracks through which the effect is lost. And active influence on weak links, eliminating the so-called minimal factors, is the most important economic method for increasing the final effectiveness of the food complex as a whole. We are aware of the minimal factors in the agro-industrial complex. They include, above all, arrears in the production infrastructure of agriculture, a shortage of processing capacities, warehouses and storehouses, serious shortcomings in construction, technical and agro-chemical services, transportation and product sales. Overcoming another minimal factor--the shortage of labor force in rural areas--entails the development of a modern social infrastructure. Finally, the existence of rayons and farms that are backward because of objective and subjective factors is a serious impediment to the overall development. The tendency toward their becoming permanently and more profoundly backward causes special concern. In rayons and on farms with a low level of earning power and the worst conditions for labor and life, there is an extreme outflow of working force and its structure is deteriorating. There is a danger that processes will begin which are difficult to reverse (requiring especially large expenditures) or which are even irreversible. Yet it is known that with a comprehensive approach, with relatively small outlays, it is possible to increase the yields and productivity in places where they are now comparatively low.

The problems enumerated above cannot be solved on the rayon level alone, or on the level of narrow branch or territorial administration of the complex. If each organization creates its own food and social infrastructure and parallel construction, repair and other services, there will not be enough of any kinds of resources. Intrarayon funds and efforts alone are not sufficient to bring up backward units. For example, such rayons as Vyruskiy, Valgaskiy, Kingiseppskiy, Khiyumaaskiy and Khaapsaluskiy do not have enough funds of their own to do this. According to a comprehensive evaluation of their agro-economic potential (land, production capital, labor force) these rayons, as compared to such rayons as Khar'yuskiy,

Vil'yandiskiy, Rakvereskiy and Paydeskiy, fail to obtain tens of millions of rubles in profit annually.

The need to create an integral system of planning and administration of the agro-industrial (food) complex was emphasized in the decisions of the 25th and 26th party congresses and a number of plenums of the CPSU Central Committee. "Life demonstrates," said L. I. Brezhnev at the November (1979) Plenum of the CPSU Central Committee, "that agricultural production cannot be regarded in isolation from the system of procurements, transportation, storage, process and trade in food products. All these are a unified food complex. And they must be planned as a unified whole. The distribution of capital investments and other resources should serve a final goal--improving the supply of foodstuffs for the population. And they must be controlled as a unified complex, providing for continuous and rapid movement of products--from production to the counters of stores. The system of planning indicators and material incentives should be arranged in such a way that the workers of each unit are motivated to deliver to the consumer the largest possible quantity of products, and high-quality products at that. It is precisely from this standpoint that the food problem must be solved under the new five-year plan."

At the 18th Congress of the Communist Party of Estonia, the first secretary of the Central Committee of the Communist Party of Estonia, K. Vayno, noted that at the level of the rayon we have found an effective form of administration, and now the task consists in skillfully transferring it to other rural rayons. Additionally, it is necessary to think deeply about how to administer the agro-industrial complex of the republic as a whole. Several suggestions regarding this question are presented below.

Proposed Organizational Structure and Functions of the Republic Agro-Industrial (Food) Complex

The problem of organizational and economic structuring of the union agro-industrial (food) complex is one of the most complicated ones. It seems that it can be solved in stages, experimentally checking and selecting the best organizational and economic structures of administration of the agro-industrial (food) complexes at the republic level. It would seem that the Estonian SSR is best prepared for conducting the experiment. It has already accumulated experience in administering rayon agro-industrial complexes and certain organizational and economic prerequisites for creating a complex on a republic scale exist here.

The experiment with new administrative structures at the republic level, while retaining the old structures at the union level, of course, entails certain difficulties, but they can be surmounted by applying a stage-by-stage tactic for development and utilizing intermediate and transitional organizational and economic forms. Some people think that the best solution would be to create a total republic agro-industrial block and the corresponding administrative agency which would be fully in charge of all resources, receiving centralized limits of financial and material funds from union agencies at one time and bearing full responsibility for their utilization and the production of the final output. This would be the optimal solution to the problem. But since various structures of administration are still retained at the national economic and republic levels, this approach would create great difficulties in material and technical support for the development of the republic agro-industrial complex.

Under modern conditions it seems expedient to carry out organizational structuring of the republic agro-industrial (food) complex on an associative basis, presupposing dual--union and republic--jurisdiction of the ministries and departments that are included in it. Hence there is a certain limitation of the functions of the republic agency for administering the complex. It must not replace branch administration with territorial administration, but provide for a correct combination of them, achieving a unified direction for the actions of all constituent parts of the complex and the necessary structural changes, basically through methods of regulation (mainly economic). But the predominance of regulating methods does not mean that the administration of the republic complex amounts only to the coordination of the actions of constituent parts. We need effective control whereby the central agency of the agro-industrial complex would have actual rights and material and financial resources for achieving the earmarked goals.

Correct determination of the makeup of the republic agro-industrial complex is especially important. To include too many ministries and departments in it will make administration more difficult and lead to duplication of the work of the republic council of ministers. In this author's opinion, the republic complex should include only those ministries and departments (and also their subdivisions) that are primarily involved in producing the final product and supplying it to the consumer.

It should be noted that the republic level of the agro-industrial complex is different from the union one. At the union level a significantly greater proportion (up to one-third of the value of the final product) goes to the first block of the complex (production of means of production for agriculture). In the Estonian SSR this proportion is less, and the enterprises that produce means of production for agriculture are engaged primarily in serving the union complex. In the Estonian SSR the agro-industrial complex is essentially a food complex which produces and sells mainly (more than 80 percent) the final meat and dairy products. Therefore it is organizationally expedient to include in the republic complex mainly those ministries and departments, and also rayon agricultural associations, that comprise the republic's food complex.

It is suggested that the republic agro-industrial complex include the following departments and associations: the ministries of agriculture (with enterprises and institutions under its jurisdiction) and fruit and vegetable farming, procurements, the meat and dairy industry, the food industry, forestry and protection of nature, Goskomsel'khoztekhnika, the State Committee for Land Reclamation and Water Management, the ERSPO, the Estkolkhozstroy association, the Estelektroset'stroy trust, the Estsel'khozkhimiya scientific production association, and rayon agro-industrial associations. The group of departments and organizations included in the republic complex can be expanded or reduced, but only with careful study of their production functions and ties. The complex can also include individual subdivisions of one system or another (for example, of the ministries of trade, construction, automotive transportation and highways, and so forth).

For management of the republic agro-industrial (food) complex, it would be expedient to create a council consisting of managers of ministries, departments and associations that comprise the republic complex, and also of the corresponding subdivisions of the Gosplan, Ministry of Finance, Gossnab, Gosbank, the Estonian SSR State Committee for Prices and scientific institutes. It would be expedient to make the

workers of the staffs of the ministries and departments included in the complex responsible for a number of functions. For example, the development of long-term programs and plans could be handled by the corresponding division of the republic Gosplan and scientific research and design institutes. The council would have to be staffed with highly qualified specialists from the financial-economic and legal services. This agency of the agro-industrial complex should be under the jurisdiction of the Estonian SSR Council of Ministers.

The main task of the council and its staff would consist in ensuring efficient functioning of the republic complex and achieving balance among its parts and progressive structural changes for purposes of steady and dynamic increase in the production of the final product in order to cover internal and centralized needs for foodstuffs with the best utilization of land, material and labor resources. The problem does not amount to just creating another additional administrative unit and increasing the staffs. We are speaking about changing the quality of the administration of the complex and providing for its integrity, the utilization of science and the achievement of good results.

The Economic Mechanism for the Functioning of the Republic Agro-Industrial Complex

The economic mechanism of the complex should be arranged on the basis of a consistent combination of centralized planning and the independence, initiative and motivation of its constituent parts for efficient work with the greatest possible contribution to the overall final result.

Centralized planning is carried out on the basis of a scientifically substantiated republic food program which determines the long-term development of the republic complex and embraces the final economic and social goals, the stages in their attainment, and the main directions and tactics of investments. The long-term target program should become the basis for the development of plans of branch and territorial units and should not be simply the total of these. In the first stage there could be serious difficulties in combining and coordinating the overall program of the republic complex with the plans of ministries and departments that are under the jurisdiction of union agencies.

In keeping with the decisions of the 26th CPSU Congress, it would be expedient to considerably reduce the number of assignments and indicators that originate with higher planning agencies and to orient them towards final results, taking into account the existing production and economic potential and its actual growth. Thus, in our opinion, the rayon associations should be given the following planning indicators:

1. The quantity of the main kinds of agricultural products sold to the state (for five years with a breakdown for the various years), taking into account an efficient scheme for the distribution of production throughout the republic and evaluation of the agro-economic potentials of the rayons;
2. Sales prices for products and deductions into centralized republic funds;
3. The amounts of state capital investments and limits for construction and assembly work;

4. The volume of material and technical support.

In principle, the approach of the union agencies to the republic complex should be the same. Thus there would be a considerable increase in the role of economic factors for influencing planning. It is extremely necessary to change over from customary methods of administrative control to economic regulation. A distinguishing feature of the latter is planned administrative influence on the autonomous financing interests of the farms and associations that motivate them to implement decisions that are most effective for the society.

Let us give a couple of examples. There are significant reserves for further increasing production and reducing expenditures per unit of output in efficient distribution of production, taking into account natural and economic potentials. According to the calculations of scientists, optimal distribution of crop growing alone, paying attention to the conditions for raising individual crops on lands of various quality, makes it possible to essentially reduce production costs and increase the profit of the farms obtained from crop growing by 15 percent. If one adds to this the optimal distribution of animal husbandry, the increase in profit reaches 25 percent. But why are the recommendations of scientists being carried out so slowly? The reason lies not only in shortcomings in planning. The system of interests is not working either. With existing procurement prices one product produces a relatively high income while another requires large expenditures of labor and capital, but still produces little income or even causes losses. As a result, administrative methods must be used to force the farms to produce the products with less income (and, as compensation, to plan for them to produce more advantageous ones as well), and in the final analysis the less efficient, multibranch, fragmented structure of production is retained.

How can the problem be solved? Wait until the union agencies regulate and optimize the ratios among procurement prices for all kinds of agricultural products for all republics and oblasts? This problem can be solved more efficiently and better within the framework of the republic agro-industrial complex, taking advantage of the mechanism of rebates from procurement prices for relatively highly profitable products and discounts from prices for the less profitable ones. To these ends it is necessary to create a special republic fund. Incidentally, the ratios among procurement prices are being successfully regulated in agriculture in the Georgian SSR.

It is important for the overall level of procurement prices established for the republic to cover the normal expenditures on reproduction. After the March (1965) Plenum of the CPSU Central Committee the level of procurement prices made it possible to regulate their ratios in the republic since the profitability of agricultural production was close to the optimal (about 40 percent). But since that time production costs have risen and profitability has decreased. These processes are not explained entirely by the unfavorable weather conditions of 1978-1980. The increased production costs of agricultural products reveal a longer-term and steadier tendency. Calculations show that the production cost increased by two-thirds as a result of the increased cost of means of production that were provided to agriculture by industry. Therefore agrarian economists consider it necessary to achieve a corresponding coordination between price indexes for industrial goods which are supplied to agriculture and procurement prices for agricultural products.

One way or the other we will have to cover planned expenditures for expanded reproduction in agriculture. But when the level of procurement prices is not high enough this is frequently done by methods that are not a part of autonomous financing. The credit indebtedness of the farms and the sum of debts written off by the state are increasing more and more. With this approach agricultural products cost the society more than they would if there were economic accountability and prevention, programmed in the socially normal price level. It also seems that zonal differentiation of prices is arising not on the basis of actual difference in production costs, but taking into account the objective evaluations of natural and economic potentials. In particular, a single level of procurement prices should be established for the three Baltic republics which have approximately the same natural and economic conditions.

Within the framework of the republic agro-industrial complex, methods of economic regulation can be used to solve the problem of ensuring a normal process of reproduction in regions with relatively worse natural and economic conditions and inadequate internal sources for accumulation and material incentives.

The economic method of planned regulation dictates the need for centralization within the republic complex of part of the material and financial resources, and the creation of the corresponding funds for economic influence. As the experience of the Vil'yandiskoye and Pyarnuskoye rayon agro-industrial associations shows, the formation of centralized funds provides for the realization of long-term programs for balanced production and social development, bringing up the backward farms and units and also accounting for the interests of all members of the association. On the scale of the republic complex, it is expedient to form the following centralized funds:

1. The development fund, used mainly for improving the interbranch structure of the complex and solving large economic and social problems of an interbranch nature;
2. The assistance fund, for bringing up the rayons that have fallen behind because of objective factors;*
3. The material incentive fund for additional stimulation of units that make a significant contribution to the development and overall increased efficiency of the republic agro-industrial complex;
4. The fund for adjusting the ratios among procurement prices;
5. The reserve fund.

The centralized funds can be formed from deductions from the ministries and departments and also rayon associations that are part of the republic complex whose agro-economic potential has been evaluated as higher than the average republic indicator. Judging from the calculations, approximately 10-15 percent of the financial

*Taking into account the seriousness of the problem, this fund can and should be created through interbranch redistribution of profit in the near future.

resources would thus be subject to centralization. A large part of the resources, which have remained at the disposal of the branch and territorial units, will provide for their independence and motivation to achieve good results in their economic activity, and also responsibility for their achievement.

Evaluation and stimulation (material and moral) of the results of economic activity occupy an exceptionally important place in the mechanism of economic regulation. But here too a certain amount of restructuring is needed. Until recently the system of evaluation and stimulation was oriented primarily toward fulfillment and overfulfillment of the plans for the production and sale of products. There is no need to show how important it is for all economic units to fulfill the state plan. But the system of evaluations and stimuli should not be related only to the fulfillment of plans. This creates conditions for the development of economic "enterprisingness" in the direction, as they said at the 26th CPSU Congress, of receiving less planned assignments and more resources.

The Estonian SSR has conducted a comprehensive evaluation of the agro-economic potentials of all farms in terms of the indicator of normative income with the given supply of land, material and labor resources, and also taking into account production specialization. A comparison of the actual and normative income rates gives the coefficient of the efficiency of the utilization of the existing agro-economic potential for each farm and rayon. And it is typical that on many leading farms--the winners of the socialist competition for fulfilling planning assignments according to gross production and sale of agricultural products to the state--the coefficient of the utilization of the agro-economic potential was lower than the average for the republic. The enterprisingness of their managers was directed primarily toward "shaking loose" resources that are in short supply (technical equipment, fertilizers, mixed feeds), whose availability, of course, makes it easier to fulfill the plan.

In the accountability report at the 26th CPSU Congress, Comrade L. I. Brezhnev noted that the center of gravity in agriculture is moving toward increased returns from capital investments, increased productivity and increased efficiency in the utilization of resources. It is necessary to reorient the economic mechanism in this same direction, primarily the evaluation and stimulation of the results of economic activity, at whose basis should lie the achieved level of production and the efficiency of the utilization of resources--land, funds and labor force which comprise the actual agro-economic potential of each republic, rayon and farm.

According to the objective evaluations of agro-economic potentials, one should establish planning assignments, distribute material resources (taking into account the existing degree of efficiency of the utilization of already existing resources), and make payments into the budget and into centralized funds of the associations. In Vil'yandiskiy Rayon differentiated normatives have been established for deductions into the funds of the agricultural association from the profit of the farms on the basis of an integrated economic evaluation of their resources. The association distributes resources among the farms in such a way as to obtain the greatest final effect, part of which remains with the farm to stimulate better utilization of resources assigned to it. This does not impinge upon the normal interests of economically strong farms where, taking into account the experienced personnel and the good production base, the association send resources for creating facilities

for interfarm purposes. But, having obtained more resources from the society, the farms have greater responsibility to the society for efficient utilization of the means--part of the effect according to the normative evaluation transfers to the association and is utilized for realizing the overall program for economic and social development, including for bringing up the backward farms. The same principle of distribution of resources and formation of centralized funds could be rationally applied in the republic and, subsequently, in the national economic agro-industrial complex. Of no less importance is the problem of evaluating and stimulating the activity of spheres that serve agricultural production. The solution to this problem should be coordinated both with the performance of the usual functions of the given sphere and with the final result of the economic activity of the agro-industrial complex at the rayon and republic levels. Moreover it should be possible for the council of the republic agro-industrial complex to use the centralized material incentive fund to give additional material incentive for units and specific individuals who serve agriculture and have made a significant contribution to the achievement of a greater effect--obtaining the final food product with reduced expenditures per unit of it.

The role of contractual relations which envision clearcut mutual commitments of economic partners to one another and the reimbursement for material damage in the event of their violation should play a much greater role in the economic mechanism for the functioning of the republic agro-industrial complex. There should be a firm contractual basis for the relations not only among economic partners within the republic complex, but also between them and union departments, and also other territorial (republic and oblast) units of the union agro-industrial (food) complex. It seems that a firm plan for the sale of agricultural products to the state that has been established for the republic should be registered in a special agreement which envisions the corresponding counterdeliveries, their nomenclature, volumes, delivery times, prices and so forth. Products that remain after the fulfillment of planned contractual commitments can be used for interregional exchange which is also carried out on the basis of contractual relations. This will provide not only for stability of economic relations (taking into account, naturally, the specific features of agriculture), but also for an effective system of stimulating increased production of foodstuffs and increasing the responsibility of republic and oblast agencies for supplying the population of their regions. With the development of interregional contractual commitments, the realization of the principle of self-supply of food will not undermine a rational system of distribution and specialization of production of agricultural products among the various natural and economic zones of the country.

The suggestions that have been made are not entirely indisputable. In the final analysis only future experience will show which organizational forms and economic mechanism for the functioning of territorial agro-industrial complexes will turn out to be the best. But this experience can be acquired only in the process of improving former methods and searching for new ways of carrying out the tasks set by the 26th CPSU Congress in the area of developing the agro-industrial complex of the entire country.

COPYRIGHT: Izdatel'stvo TsK KP Estonii, "Kommunist Estonii", 1981

11772

CSO: 1824/457

AGRO-ECONOMICS AND ORGANIZATION

PLANS FOR RESOLVING PROBLEMS IN KAZAKH AGRICULTURE

Alma-Ata NARODNOYE KHOZYAYSTVO KAZAKHSTANA in Russian No 6, Jun 81 pp 28-31

[Article by Ye. Zakshevskiy, chief of the Main Planning and Economic Administration of the Kazakh SSR Ministry of Agriculture, honored economist of the republic: "New Work in Planning Agricultural Production"]

[Text] In the foreground of the complex of tasks earmarked by the 26th CPSU Congress for improving the well-being of the people is the task of improving the supply of food products for the population. To this end the party has found it necessary to develop a special food program, in which agriculture is assigned a most important place.

The Main Directions that were approved by the congress attach exceptional importance to further increasing the production of grain and animal husbandry products, primarily meat and milk.

In implementing the earmarked tasks a respected and responsible role will be played by Kazakhstan, one of the largest grain and animal husbandry bases in the country. Under the Eleventh Five-Year Plan, the republic will have to increase the average annual volume of gross agricultural output by 11-13 percent and provide for an average annual production of grain in the amount of 28-29 million tons, meat (in slaughtered weight)--1.2-3 million tons, milk--4.9-5 million tons, wool--110,000-115,000 tons, and Persian lamb hides--2.5 million.

One must say that the plans are difficult, but completely realistic. We have created a reliable material and technical base for their implementation. The rural areas also have management personnel and specialists who are real masters of farming and animal husbandry. During the years of the past five-year plan alone, almost 74,000 workers of the fields and farms earned government awards.

The republic's grain growers especially distinguished themselves under the Tenth Five-Year Plan. They increased the average annual grain yield to 27.5 million tons, depositing in the grain bins of the homeland more than 81 million tons of grain, or an average of a billion poods a year. The five-year assignment for procuring grain was overfulfilled by 333 million poods.

Marked positive changes have taken place in animal husbandry and in other branches of agriculture.

But, as was noted at the 15th Congress of the Communist Party of Kazakhstan, there are still many shortcomings and unutilized reserves in the development of agriculture. Suffice it to say that 71 rayons and almost 800 farms did not fulfill the five-year plan for grain; 169 rayons did not fulfill assignments for procuring meat; and every third rayon failed to fulfill assignments for procurements of milk.

Still, every fifth farm obtained an average of 14-20 quintals of grain per hectare during the year, and every seventh farm--more than 20 quintals. The experience of the leading sovkhoses and kolkhoses, rayons and oblasts, shows that we have capabilities of increasing the productivity of grain crops in the country by an average of 2-3 quintals and increasing the gross yield of grain to 28-29 million tons a year, as was envisioned by the Main Directions. To do this it is necessary to put our most important reserves into work--to bring the backward farms up to the level of the leading ones.

"Solving the problems that face us and utilizing the possibilities we have at our disposal," said Comrade L. I. Brezhnev at the party congress, "depends largely on the level of management of the national economy and on the level of planning and administration."

Under modern conditions high requirements are placed on workers of the economic services of agricultural agencies, sovkhoses and kolkhoses, and all branches and enterprises of the agro-industrial complex. They must master the art of deep analysis and critical interpretation of the results of their operation, find more efficient ways of intensifying production and increasing its efficiency, and always be creatively searching.

Under the Eleventh Five-Year Plan, as under the preceding one, the state is allotting large material and financial resources for the development of agriculture. The planned changeover of the branch to an industrial basis will continue. It is now a matter of moving the focus to increasing the return from capital investments, efficiently utilizing resources, and deepening and expanding the ties between agriculture and all branches of the agro-industrial complex.

Under current conditions questions of improving the planning of agricultural production and improving the work of rural economic services become especially important. Correctly organized administration, whose underlying basis is planning, creates more favorable conditions for efficient management of the land and determines the optimal ratios and interactions among all production units.

The party displays constant concern for improving the quality of planning in agriculture and takes measures for creating economic conditions for successful development of the branch. An important step in this direction is the decree of the CPSU Central Committee and the USSR Council of Ministers adopted on 14 November 1980, "Improving Planning and Economic Stimulation of Production and Procurement of Agricultural Products." This document was developed fully in keeping with the points made by the 25th Party Congress and the July (1978) Plenum of the CPSU Central Committee.

The decree gives a clear-cut program of actions for soviet, planning and agricultural agencies. When drawing up plans for the economic and social development of

rural areas, they are instructed to establish unified plans for the procurement of agricultural products for the five-year period (with a breakdown for the various years). Moreover, they must provide for a differentiated approach to each republic, kray, oblast, rayon and each farm, and they must take into account more fully their production area and natural and economic factors.

The farms' assignments for procuring products should be balanced with the existing production capital and the material-technical and financial resources that have been allotted.

The plans also include assignments for introducing scientific and technical achievements, and the necessary material and technical resources are provided.

Significant incentive measures have also been envisioned. Thus beginning in January of this year the procurement prices include increments for above-plan sales of products or for sales of them above the level achieved in preceding years. Procurement prices have been increased for grain crops, soybeans, crude cotton that has been harvested by machine or by hand according to type, raw tobacco and other farming products, and also certain kinds of animal husbandry products.

Additionally, under the new five-year plan, the kolkhozes, sovkhoses and other agricultural enterprises and associations will be paid increments in the amount of 50 percent of the procurement prices for sales to the state of grain, sunflowers, sugar beets, crude cotton, soybeans, potatoes and a number of other crops and also cattle and poultry, milk, wool, eggs, Persian lamb hides and young reindeer horns in excess of the average level achieved during the preceding five years.

In order to increase the incentives of the workers of sovkhoses and other state agricultural enterprises to increase the production of products and improve the efficiency of agricultural production, two conditions have been introduced for awarding bonuses to management workers and specialists of these enterprises.

Specialists of farms can be awarded bonuses for the results of the operation of the corresponding branches or production sections in which they are employed. This condition is especially valuable for those farms that have introduced the branch (shop) structure of production administration.

It becomes extremely important for planning agricultural production and also for organizing effective autonomous financing to establish in the plan economic norms, including material incentive funds. Practical implementation of the new system of planning and economic stimulation will exert a favorable influence on the development of agriculture and raise it to a qualitatively higher level.

The new system of planning embodies the Leninist principle of organization which presupposes a combination of a centralized basis with initiative from below. ". . . there is not and cannot be a concrete plan for organization of economic life," wrote V. I. Lenin. "No one can provide it. But the masses can do this from below, through experience. Instructions will be given and paths will be earmarked, of course, but it necessary to begin immediately both from above and from below."*

*V. I. Lenin, "Poln. Sobr. soch." [Complete Collected Works], Vol 35, pp 147-148.

This policy of planning is becoming ever more solidly established in life. It makes it possible for the sovkhozes, kolkhozes and other agricultural enterprises and associations, on the basis of scientifically substantiated intensive plans, to determine for themselves the structure of their planted areas, to introduce progressive agrotechnology, to calculate the number of livestock that are to be maintained on the farms, to determine the direction in which the feed base will develop, that is, to creatively and economically solve all the problems of increasing the production of products, improving their quality and reducing production costs. This way managers and specialists have more responsibility for conducting business in farming and there are greater possibilities for agricultural workers to display creative initiative and intelligent enterprisingness. Many convincing facts can be adduced to demonstrate this.

Let us look, for example, at the experience of the Kustanayskaya workers. Farmers of the oblast overfulfilled the Tenth Five-Year Plan for the sale of grain and provided the country with 1 billion, 41.5 million poods of grain. As compared to the Ninth Five-Year Plan the average annual grain production increased by 51 percent as a result of increased productivity, and procurements increased by 62 percent.

The upsurge of grain production accelerated the rates of development of animal husbandry. The farms and complexes have considerably increased the number of head of large horned cattle, hogs, sheep and poultry. The five-year assignment for the procurement of milk, eggs and wool were fulfilled ahead of schedule.

Party, agricultural and planning agencies of the oblast and managers and specialists of the farms, relying on the developments of scientific research institutes and experimental stations, are carrying out an entire system of measures directed toward advancing the science of farming and animal husbandry and actively introducing the achievements of science and advanced practice. They have developed and are implementing an efficient system of farming and progressive technologies for maintaining livestock, and on fields they have registered highly productive strains of grain and other crops.

Much has been done in the oblast to deepen interfarm specialization and concentration of production, to consolidate brigades and farms and to change them over to autonomous financing.

Kustanayskaya workers have accumulated a considerable amount of experience in comprehensively solving the problems related to the development of agriculture. While increasing the number of head of livestock, they are at the same time concerned about providing them with full-value feeds and premises, about mechanizing labor-intensive processes on the farms, and about staffing the animal husbandry facilities with skilled personnel. During the years of the Tenth Five-Year Plan alone, the farms in the oblast put into operation production facilities to accommodate 136,000 head of cattle, and the capacities of the reconstructed farms have almost doubled.

In solving the feed problem, Kustanayskaya workers rely on expanding the production of grain forage crops. In the structure of the planted areas, they occupy a total of 800,000 hectares. Corn and Sudan grass are cultivated on large areas. Many sovkhozes are planting barley, oats and peas in the summer. They harvest them in

the stage of milky ripeness for haylage. Wastes obtained from cleaning food grain on mechanized threshing floors occupy an important place in the feed balance.

At one time the farms of the oblast were the initiators of the movement for a radical improvement of meadows and pastures. During the past ten years this work has been conducted on an area of more than 1.7 million hectares. As a result, the productivity of grasses increased and hay procurements increased significantly.

Feed preparation has also been fairly well arranged. There are more than 370 preparation shops in operation on the farms.

The experience of the Kustanayskaya workers shows what can be done with correct organization of planning when it is directed toward the utilization of reserves and toward a radical improvement of their work.

Rural workers accepted with satisfaction the provisions of the decree of the CPSU Central Committee and the USSR Council of Ministers which condemns the practice of giving kolkhozes, sovkhoses and other agricultural enterprises assignments that are not envisioned by the state plan. And indeed, who if not the production workers themselves can determine in the five-year and annual plans the volumes of the production of products, the sizes and structure of the planted areas, the harvest yield, the numbers and productivity of livestock, the technology and organization of production, and other indicators. In the final analysis it is they, the masters of the land, who are primarily responsible to the state for the fulfillment of plans for the production and procurements of products from the fields and farms. They are the ones who have the immediate knowledge. Bureaucratism and disregard for the opinions of the managers and specialists of the farms and the experience of the advanced workers, which one still encounters sometimes, are poor helpers in the matter. In this connection, I should like to remind certain adherents of the arbitrary method of leadership of the instructions of V. I. Lenin concerning the need to relate planning to life, to account for the actual possibilities, and to rely on advanced practice and the achievements of science. "Less intellectual and bureaucratic self-importance," wrote Vladimir Il'ich, "and more study of that which our practical experience, centrally and locally, provides, and of that which science has already given us."*

Of course the measures earmarked in the decree cannot be implemented in one day. There are a number of questions in the system of agricultural planning that require careful study before adopting the optimal variant of their solution. Now, for example, in planning the production of products one uses as a basis the level reached in the past 3-5 years. In practice this leads to a situation where the farms that have an overexpenditure of funds in the process of production and low crop yields and poor productivity of livestock, when developing their regular annual plan are oriented to lower indicators. And the farms that have achieved the best production indicators are at a disadvantage in this case.

*V. I. Lenin, "Poln. sobr. soch.," Vol 42, p 347.

The great diversity of organizational-economic, natural-economic and other conditions which actively influence the process of production also requires further improvement of planning and calculation of the production costs of agricultural products. In order to simplify methods of planning expenditures in agriculture, it seems, one should change over from complex calculations for determining the production costs of products and comparison of technological charts to the introduction of consolidated normatives for direct expenditures in terms of the various elements (earnings with deductions, petroleum products, amortization of fixed capital, expenditures on current repair of fixed capital, and other expenditures) per 1 or 100 hectares planted in agricultural crops and per 1 or 100 head of livestock.

Normatives should be developed for each agricultural crop and for each kind of livestock, taking into account the concrete production conditions of the farm or zone, the technologies that are being applied, the output norms and the system for maintaining the livestock, labor expenditures and funds, taking into account the given productivity of agricultural crops and animals. In other words, it is necessary to have optimal normatives which account for all natural, economic and other factors in their totality.

With the normative method of planning direct expenditures one not only reduces the amount of time spent on developing calculations of production costs, but one also eliminates such phenomena as reducing plans so that they require no effort or increasing them so they cannot be fulfilled.

At the present time general production and general economic expenditures are distributed in proportion to the sum of direct earnings, calculated amortization and expenditures on current repair of agricultural equipment. The application of this method makes it possible to distribute overhead expenditures more correctly for the various kinds of products that are produced. But in the optimal variant the overhead expenditures should be distributed in proportion to all direct expenditures, including those such as expenditures on seeds, feed, fuel, lubricants and so forth. This method considerably simplifies the work of making calculations to determine the proportion of indirect expenditures that are included in the objects being calculated. Additionally, overhead expenditures will relate more correctly to outlays on production of those kinds of products which have a smaller proportion of earnings, but for which greater production funds are required.

For example, the Leninskiy Sovkhoz in Kaskelenskiy Rayon in Alma-Atinskaya Oblast has standard cow barns in which all production processes are mechanized. Dairy cows are kept in stables year around. Next to the cow barns are well equipped exercise areas (all these facilities are costly). According to the existing method of distributing overhead expenditures, there are 0.15 rubles per ruble of direct expenditures.

But on this same sovkhov there are inexpensive fattening areas (of the light construction type) for fattening large horned cattle. Feeds are brought to the areas by automotive transportation which is not included in the agricultural equipment when distributing overhead expenditures, and there are almost no amortization deductions. Therefore overhead expenditures per ruble of direct expenditures are only 0.08 rubles here. But if one were to distribute these expenditures according to the method we propose, there would be 0.12 rubles for every ruble of direct

expenditures on the dairy herd and on the fattened livestock, and as a result of this the production cost of milk and weight gain would change since the absolute sum of overhead expenditures for the dairy herd would decrease by 12,700 rubles and for the livestock being fattened, conversely, it would increase by 11,000 rubles.

Soviet, agricultural and planning agencies and economic services of the sovkhozes, kolkhozes and associations still have a lot to do in order to determine the optimal ratio among agricultural branches, the production of crop growing and animal husbandry products, and increasing the number of head of livestock and providing them with feeds and premises. There is no doubt about the urgency of this problem. After all, up to this point when drawing up the national economic plans there were frequently violations of the proportions between the development of branches and other sections of the plan. For example, the rates of increase in the production of products are clearly more rapid than those of the construction of storehouses for potatoes, vegetables and fruits, and so a considerable part of the harvest is fed to livestock or it perishes.

The same picture can be observed in animal husbandry, which is developing considerably more rapidly than premises are being constructed for the livestock. Therefore a large number of animals are kept in temporary, poorly suited structures.

There is a great disproportion between the volume of cargo shipments and the availability of means of transportation in rural areas, which is felt especially critically during the harvest period.

To eliminate these disproportions is one of the most important tasks and a true way of solving it is to successfully carry out the program earmarked by the party for the creation and development of agro-industrial associations and complexes.

There are a number of other unsolved problems in planning agricultural production which would be difficult to enumerate in one article. The main thing, as was emphasized in the accountability report of the CPSU Central Committee to the 26th Party Congress, is to make the 1980's a period in the agrarian policy that is distinguished by high returns from capital investments, increased productivity of agriculture, and further improvement of the economic conditions for the operation of the kolkhozes and sovkhozes.

Comrade L. I. Brezhnev's words at the congress appealed to the mind and conscience, heart and honor of each Soviet person:

"We, comrades, are now able to solve the greatest and most complicated problems. But the pivotal point of the economic policy will be something which seems simple and ordinary--a thrifty attitude toward the public good and the ability to use everything we have fully and expediently. The initiative of labor collectives and party-mass work should be directed towards this. The technical policy and the policy for capital investments, the system of planning and report indicators should be directed towards this. The economy should be economical--such is the requirement of the times."

Rural workers of the republic, inspired by the decisions of the 26th CPSU Congress and the 15th Congress of the Communist Party of Kazakhstan have entered into a new battle for grain, for wealth and for the might of our homeland.

COPYRIGHT: "Narodnoye khozyaystvo Kazakhstana", 1981.

TILLING AND CROPPING TECHNOLOGY

URGENT CROP FARMING PROBLEMS, SOIL FERTILITY, GRAIN YIELDS DISCUSSED

Moscow VESTNIK SEL'SKOKHOZYAYSTVENNOY NAUKI in Russian No 8, Aug 81, pp 43-56

[Article by N. P. Panov, corresponding member of VASKhNIL: "Urgent Problems of Farming"]

[Text] Agrarian scientists were deeply satisfied with the historic decisions of the 26th CPSU Congress. The Main Directions for the Economic and Social Development of the USSR During 1981-1985 and the Period up to 1990, approved by the 26th CPSU Congress, brought attention to ensuring further acceleration of scientific and technical progress in all branches of the national economy, the creation and introduction into production of principally new technical equipment and material as well as progressive technology, increased effectiveness of scientific research, considerable reduction of the time periods for introducing the achievements of science and technology into production, increased results of fundamental and applied research, and stronger mutual ties between science and production. Under the Eleventh Five-Year Plan there is to be further development of the agro-industrial complex whose main task is to reliably provide the country with foodstuffs and agricultural raw material. In order to carry out the task that has been set, it has been recognized as necessary to develop a special food program.

Agrarian scientists and agricultural workers have to considerably increase the production and improve the quality of products, and continue their course toward all-around intensification of agricultural production. During the five-year period they are to increase the average annual production of agricultural products by 12-14 percent and labor productivity by 22-24 percent.

The most important tasks for farming are an all-around increase in the fertility of the soil and productivity, and further increase in the production of grain, feeds and other products on the basis of the application of zonal scientifically substantiated systems of farming. Grain production is to be increased to 238-248 million tons, including pulse crops--to 12-13 million tons, raw cotton--to 9.2-9.3 million tons, and sugar beets--to 100-103 million tons; there is to be more production and procurement of millet, buckwheat, rye, rice, wheat of durum and strong strains, corn and grain forage crops.

An immediate task for farming is radical improvement of feed production, giving it a specialized branch nature. Attention is being devoted to improving the quality of feeds, and solving the problem of feed protein, primarily through expanding the

planted areas and considerably increasing the production of peas, alfalfa, clover, lupine, soybeans, rape and other high-protein crops, and increasing the yields of feed crops and the productivity of natural feed lands.

In past years scientific research institutes of a farming profile and sections and coordination councils under the VASKhNIL division for farming and chemization have concentrated most of their attention on prompt fulfillment of thematic plans for scientific work which is directed toward intensifying farming, increasing the fertility of the soil, effectively utilizing chemical means, protecting the soil from erosion, protecting the environment, achieving high and stable yields of agricultural crops, and creating a reliable feed base.

A large amount of attention is being devoted to questions of increasing the fertility of the soil. Soil scientists and farmers have developed effective devices for improving soil fertility which are based on the application of optimal and balanced norms of organic and mineral fertilizers as well as the implementation of a complex of agro-technical and ameliorative devices. Still, the shortage of fertilizers and the failure to follow scientific recommendations concerning the use of land in a number of places lead to a reduction of soil fertility, a loss of part of the crop, especially in unfavorable years, and the development of soil erosion which causes significant harm to agriculture. Protection of the land from erosion and its efficient utilization constitute a most important task for farming. In past years the area of arable land in the country has increased, but because of the increased population the area of arable land per one individual is constantly decreasing. Taking into account the limited possibilities of further expansion of the area of arable land, it is necessary to concentrate primary attention on more efficient utilization of existing plowed land. To do this, in the first place, it is necessary to regularize the allotment of land for nonagricultural needs, using only land that is not suitable for plowing for these purposes.

Under the Tenth Five-Year Plan our country conducted considerable research for the creation and improvement of zonal systems of farming, the study and introduction of progressive technologies for the cultivation of agricultural crops, the improvement of the structure of the planted area and specialization, the introduction of scientifically substantiated crop rotations, and the improvement of systems of soil cultivation and measures to fight against weeds. The results of the research on all of these questions were generalized at zonal conferences for increasing the production of agricultural products and increasing the efficiency and stability of farming which were conducted during 1980 and approved at the VASKhNIL session.

A large achievement of farming science was the theoretical substantiation, development and introduction of a soil protection system of farming in Northern Kazakhstan and Western Siberia. This was done by a collective of scientists of the All-Union Scientific Research Institute of Grain Farming under the leadership of VASKhNIL academician A. I. Barayev. This system basically made it possible to solve the problem of protecting the soil in this region from wind erosion. It is based on subsoil tilling, short crop rotations (4-5 fields) and clean strip fallow, planting with special stubble feeders, snow retention and strip distribution of crops on eroded land. At the present time the soil protection technology for the cultivation of agricultural crops is being introduced on an area of about 40 million hectares. The economic effect from its introduction amounts to more than 700 million rubles a year.

The soil protection system of farming was also applied in other arid regions of the country, particularly in the Volga region, the Northern Caucasus and the south of the Ukraine. Last year it was applied on more than 3 million hectares in the Ukraine. The experience of Poltavskaya Oblast is worthy of attention. Soil protection technology for the cultivation of agricultural crops, based on subsoil tilling, is applied on an area of about 1 million hectares here. On a number of farms, even under the unfavorable conditions of 1980, they harvested 40-46 quintals of winter wheat per hectare. As a result of the introduction of the new technology for the cultivation of soil, in six years they obtained more than 500,000 additional tons of grain, and the average yield per hectare was 3 quintals more than usual. Labor productivity increased by 37-40 percent and the expenditure of fuel decreased by 38-40 percent. A reduction in the expenditures on cultivating the soil and also the value of the gross additional yield during the six years provided the farms of the oblast with more than 500 million rubles in net income.

They generalized the results of the research on the effectiveness of cultivation of the soil without a moldboard, including subsoil tilling, which were conducted in various regions of the country. The data that were obtained turned out to be different, which should be explained by the great diversity of soil and climate conditions, the level of the science of farming, the degree of cultivation of the soil, the supply of cultivation tools particularly subsoil tillers, the system of soil cultivation machines as a whole, the availability of herbicides on the farms, and the structure of the planted areas.

Of special importance is the development of theoretical fundamentals and practical recommendations for soil protection systems for farming in regions with water, water and wind, and wind and irrigation erosion. Important experiments were conducted by the All-Union Scientific Research Institute of Farming and Protection of Soil from Erosion for creating theoretical fundamental and practical devices for fighting against water erosion. A complex of measures was suggested for fighting against water erosion, including technical means for implementing them in the central regions of the chernozem zone. For the first time methods were developed for improving anti-erosion complexes on a calculated basis, which accelerates and provides for scientifically substantiated planning of anti-erosion devices.

The institute was the first in the our country to conduct a unique scientific production experiment in five basins of small rivers with an area of more than 100,000 hectares. The goal was all-around evaluation of the effects of various anti-erosion devices on increasing the productivity of agricultural land and improving the protection of the soil, water resources, hydrological conditions and the microclimate.

For sloping land, soil protection technologies were created for the cultivation of winter and spring grain crops and row crops, which contributes to reducing the washing away of soil by up to 2 tons per hectare and to increasing the yield by up to 10 percent.

Under the Eleventh Five-Year Plan the institute intends to expand theoretical research and development of principally new soil protection technologies and systems of farming on sloping land.

Scientific institutions and VUZ's of the country have done a considerable amount of work to improve systems of farming, to create theoretical fundamentals of specialized crop rotation and to further develop existing and work up new devices and methods of fighting weeds. A number of important research projects have been conducted for creating devices and systems of soil cultivation, many of which have served as a basis for recommendations that are being introduced successfully into production.

Optimal indicators of density and arrangement have been substantiated for the main types of soils and crops, and the main conditions have been determined for minimizing the cultivation of the soil and the crop rotation. The expediency of cultivating the soil in the crop rotation to various depths has been proved, and differentiated methods have been suggested for row crops and winter and spring grains for the majority of regions of the country, depending on the predecessors and other conditions.

But there are still a number of unanswered questions related to the problem of soil cultivation. An increase in the energy-intensiveness of tractors makes it possible to use combined aggregates that carry out several technological operations at one time, and the utilization of effective herbicides replaces, to a considerable degree, mechanical methods of fighting against weeds. As the capacities, speeds and weights of agricultural machines increase, there began to appear negative aspects of intensive cultivation of the soil which reduce its fertility (packing, dust formation), and contradictions arose between the agro-technical need for cultivation and the negative effects of the machines on the soil. Therefore the problem of minimizing the cultivation of the soil is one of the most important ones in modern farming.

Intensification of agricultural production, its specialization and further concentration place special demands on mechanical cultivation of the soil and create new conditions for its improvement. More in-depth research is necessary for the creation of a scientifically substantiated theory of soil cultivation with respect to specific types of soil and technologies for the cultivation of crops. The intensification and ever deepening specialization of farming give rise to the need to refine and revise a number of traditional devices, methods and systems of soil cultivation. At the present time it is necessary to changeover from a comparative evaluation and improvement of particular devices and methods of cultivation to comprehensive development of soil protection technologies in future specialized crop rotations with various levels of chemization.

Future technologies for soil cultivation must be created simultaneously with the designing of machines for their implementation and the development of a system of fertilizer application and plant protection. Only with the creation of optimal agro-physical conditions in the soil will it be possible to count on high effectiveness of fertilizers and their positive interaction with irrigation, new strains and new methods of protecting the plants from weeds, diseases and pests.

The basis of the comprehensive development should be a network of stationary field experiments. To this end, the All-Union Scientific Research Institute of Farming and Protection of the Soil from Erosion, with its zonal institutes, will have to organize a geographical network of support points in the country for many years of

stationary, multifactoral experiments and comprehensive study of new systems of soil cultivation.

Special attention should be given to a creative study of the effectiveness of the subsoil tilling system of soil cultivation, deep loosening, cutting slips and combining these with surface cultivations, especially in regions where there is a danger of erosion. We need the fastest possible solutions to such questions in minimizing soil cultivation as reducing the surface of the cultivated field by introducing strip and furrow cultivation and rototilling; and the study of direct planting of grain and row crops with a special feeder without preliminary physical cultivation of the soil. Very crucial for intensive farming is research to fight against over condensing the soil by using wide-grasp combine aggregates, improving the engines of agricultural equipment, moving the sets of equipment along permanent tracks, and also developing principally new large-cargo means of transportation on an air pillow, which can be used in any weather. There must be an in-depth search for ways of increasing the effectiveness of fertilizers and expanding the renewal of the fertility of the soil with minimum cultivations and combining the latter with chemical methods of fighting against weeds.

It is necessary to continue and develop research for further specialization of crop rotations on the basis of the utilization of the achievements of science in order to overcome biological factors that reduce the yields. Special attention should be devoted to scientifically substantiated crop rotations in newly irrigated regions, drained land and also regions where there is water and wind erosion.

It is now necessary to devote more attention to protecting the soil from erosion and pollution, which is impossible without improving the system of farming, especially soil cultivation systems and implements for their implementation, without improving crop rotations and ways of utilizing fertilizers and chemical means of plant protection. The system of soil cultivation, crop rotations and farming as a whole must entail soil protection everywhere. We must change over to minimum cultivations of the soil more aggressively on those farms where an advanced science of farming has been achieved. It is now obvious that one can protect the soil from erosion primarily through reducing the number of soil cultivation operations, replacing traditional moldboard cultivations with subsoil tilling, and better utilizing plant residuals for stimulating moisture and protecting the soil from erosion. But technologies for cultivating all agricultural crops should provide for protecting the soil from water, wind, and irrigation erosion and also pollution with toxic substances--pesticides.

It is especially important to develop soil protection systems for sloping lands. Most of this kind of land is in the region of intensive farming in the forest steppe zone. Our country has experience in assimilating such lands. Calculations show that the assimilation of zonal systems for slope farming, with the fundamentals of contour ameliorative land arrangement will make it possible to obtain an additional 10-12 million tons of agricultural products, in feed units, annually. But the introduction of system of slope farming is being impeded because of the lack of special machines for cultivating the soil, planting, tending the plants and harvesting the crop.

Scientists of the Soil Institute imeni V. V. Dokuchayev have done a large amount of work to study the country's soil cover. The largest amount of research has been done in classifying the soil and compiling a state soil map for the main agricultural regions of the country. These lie at the basis of the land cadaster and evaluation of the soil, the development of measures for increasing the fertility of less productive soil, recultivation of land that has been degraded by industry, and so forth. Principles and a general schema for classifying the structures of the soil cover have been developed for the first time. Principles of land classification have been created on the basis of these. Important research has been done for studying the soils of the BAM [Baykal-Amur mainline] zone.

Principles and methods have been developed for creating unified scales for evaluating the soils for the leading agricultural crops. A new system of evaluating soils and methods of directly accounting for the productivity of agricultural crops, determining expenditures on their production and controlling the change in the fertility of the soil have been compiled for a union-wide evaluation of the land.

An essential contribution has been made to the development of this theory of increasing the fertility of the soil and predicting changes in soil fertility in the process of agricultural utilization.

The results of the generalization of the balance research of the circulation of nutritive substances, done by scientists of the Soil Institute imeni V. V. Dokuchayev on soddy podzolic and medium and heavy sandy soils of Moscow Oblast, showed that regular application to the grain-row crop crop rotation of N_{80-120} , P_{70-100} and K_{90-130} and the maintenance of the minimum necessary quantity of humus (up to 2 percent) against a background of liming is accompanied by a positive balance of nutritive substances in the soil and a 1.5-2 fold increase in the yield of all cultivated crops as compared to the control group. The recommended doses of fertilizers provide for obtaining large yields (40-50 quintals per hectare of grain crops, 280 quintals of potatoes, 50-60 quintals per hectare of clover hay) with favorable weather conditions.

Important research has been conducted in recent years to study the humus balance in the soil. It has been established that the annual application of average doses of mineral fertilizers (60 kilograms per hectare, weighted dose, NPK) did not compensate for losses of humus in the five-field grain-row crop crop rotation (approximately 1 ton of water per hectare). The application of these against a background of 60 tons of manure per hectare applied at the beginning of the rotation almost stabilized the humus content and 120 tons of manure per hectare increased this quantity by approximately 0.4 percent. Large doses of mineral fertilizers (100 kilograms per hectare, weighted dose, NPK, annually) contributed to maintaining the humus content at the initial level. But these doses of fertilizer on a background of 60 and 120 tons of manure per hectare increased its content by 0.4 and 0.8 percent, respectively.

On the deep Kursk chernozem soil, in order to achieve a simple reproduction of humus in the soils, the dose of organic fertilizers, with average norms of mineral fertilizers, should be no less than 6-8 tons per hectare, including for crop rotations with perennial legume grasses.

The problem of creating a positive humus balance in the soil is one of the crucial ones in farming. The implementation of a program for expanded renewal of the fertility of the soil and increased yields is inseparably related to increasing the humus content and improving its quality.

Soil erosion in a number of regions, violations of the agro-technology for cultivating agricultural crops, and low norms for application of organic fertilizers lead to a significant reduction of the humus content in the soils. According to data of many years of experiments, with agricultural utilization of the soil without the application of sufficient quantities of organic fertilizers, the reduction of humus amounts to 30-40 percent of the initial quantity. This is especially appreciable on irrigated soil. Under the Eleventh Five-Year Plan it will be necessary to step up research on this problem. It is necessary to establish the realistically achievable optimal parameters of humus content in the soil for each zone and to continue research for determining the quantitative indicators of the links between the content, reserves and composition of humus, agro-technology and productivity of agricultural crops in order to regulate the fertility of the soils.

Under the conditions of intensive farming it becomes especially important to conduct research on protecting the soil from unfavorable natural and anthropogenic influences, and for finding ways and means of avoiding their negative consequences.

Recently multifaceted research has been conducted on regulating the fertility of irrigated land that is difficult to improve, particularly soils that contain gypsum in zones that have irrigation now or will have in the future. We have developed a classification of the soils in terms of salinity, principles for controlling the water-salt conditions and recommendations for increasing fertility and efficiently utilizing irrigated lands.

Important research has been conducted for improving solonetz soil. Increased productivity of the solonetz complexes, whose area exceeds 100 million hectares, is a large reserve for agricultural production. A solution to this problem will make it possible to significantly reinforce the feed base of animal husbandry, especially in Kazakhstan where these soils cover about 74 million hectares, and to increase grain production in the country.

The experimentation of a number of scientific research institutes and leading farms of Rostovskaya, Volgogradskaya and Tselinogradskaya oblasts and Stavropol'skiy Kray show the great effectiveness of the assimilation of certain varieties of solonetz soils that can be improved. At the present time about 22 million hectares of this kind of land is being plowed. Further assimilation of solonetz soils will be carried out as a result of plowing solonetz soils which are more difficult to improve, which require significant improvement of technologies and the agricultural equipment for cultivating for agricultural crops on assimilated solonetz soils, taking into account the ecological conditions of their distribution. Scientific research on this problem should be concentrated on the development of new methods and technologies of improving solonetz soils and determining the optimal improved conditions with respect to the solonetz soils of various ameliorative categories, the structure of crop rotations, the optimal doses of chemicals to improve it, the selection of salt resistance and solonetz resistance crops, the development of

differentiated systems for the utilization of solonetz soils for the intensification of amelioration work and the creation of favorable soil-water and nutritive conditions, which will make it possible to maximally increase the productivity of feed lands and to provide for an increase in grain production.

Chemization is one of the most important factors in the intensification and stability of farming. Under the Tenth Five-Year Plan research was conducted on many questions of the theory and practice of the application of fertilizers, on the basis of which recommendations were made for applying fertilizers under the Eleventh Five-Year Plan for all zones of the country.

The All-Union Scientific Research Institute of Fertilizers and Agricultural Soil Science imeni D. N. Pryanishnikov, in conjunction with other scientific research institutions, made a prognosis of the country's need for fertilizers in 1985 and 1990. Zonal norms were also developed for the expenditures of fertilizers, lime and manure in order to obtain the planned crop yield and productivity of hay fields and pastures, and also the average expenditures for the delivery, preparation and application of various kinds of doses of fertilizers. These norms are being used by planning agencies in order to distribute fertilizer supplies among the various zones of the country.

Recommendations were published concerning the technology and organization of the application of manure and other organic fertilizers, liquid ammonium and microfertilizers, for the preparation and application of mineral fertilizers and lime materials, and for the determination of the economic effectiveness of fertilizers and other means of chemization that are applied in agriculture. The important results of the study of the effectiveness of fertilizers were obtained on the basis of field experiments with fertilizers in the geographic network of the All-Union Scientific Research Institute of Fertilizers and Agricultural Soil Science.

Of great credit to the institute's scientists is the development of rules and methods of multi-element neutron-activation analysis. This is an essentially new future direction in the chemization of farming which involves automation of agrochemical research.

The volume of production of mineral fertilizers will increase significantly in the future. The deliveries of mineral fertilizers to agriculture in 1985 will reach 115 million tons in conventional units, but mineral fertilizers that are delivered to agriculture do not have a high content of nutritive elements. Therefore the general line for the development of the mineral fertilizer industry should be to increase the production of compound and concentrated forms. It will be necessary to sharply increase the coefficient of the utilization of nutritive substances and fertilizers, increasing it in the next decade to 75 percent for nitrogen, 35-40 percent for phosphorus, and 75 percent for potassium, as a result of the application of more progressive forms and the improvement of the technology for application.

Another important task is to provide for the optimal ratios of nutritive substances in the fertilizers, to increase the output of concentrated fertilizers and to improve their physico-mechanical properties. More progressive forms must be applied, which provide for increasing the plants' assimilation of nutritive substances. It

is necessary to increase the output of concentrated fertilizers and to improve their physico-mechanical properties.

The assortment of mineral fertilizers will be augmented in the future with new kinds of concentrated liquid fertilizers and anhydrous ammonia. The application of the latter will require the creation of an independent system of plant and railside storehouses, and also machines for its transportation, storage and application to the soil.

It is necessary to develop optimal doses and application time, and to improve methods of applying mineral fertilizers, taking into account the biological peculiarities of the crops and the agro-chemical properties of the soil. There will be widespread application of fertilizers everywhere, and local and subsurface application of large doses of mineral fertilizers with combined sets of equipment which apply them during the basic and preplanting cultivation of the soil and during planting.

Therefore scientific institutions are faced with urgent new tasks. It is necessary to step up research on the theory of mineral nutrition of plants, the study of the circulation of substances in farming, and the interactions of the soils, climate, plants and fertilizers; and to perfect scientifically substantiated systems of fertilizers for agricultural crops in specialized crop rotations. It will be necessary to step up research on the most efficient distribution of mineral fertilizers, to improve technology for applying them and lime substances, to develop technical means of providing for complete mechanization of work with fertilizers, and also to improve the quality of their preparation and application to the soil.

With the distribution of mineral fertilizer supplies that has taken form in recent years, grain and feed crops have turned out to be least provided with them. And yet certain crops are given more than is required according to scientific recommendations.

On the basis of an analysis of the effectiveness of fertilizers for the various crops and zones of the country, taking into account achieving the planned volumes of agricultural output, it would be expedient under the Eleventh Five-Year Plan to increase deliveries most for grain crops (Siberia, Kazakhstan and the central chernozem oblasts) and feed crops, in order to increase the production of grain and feeds for animal husbandry.

In recent years much has been done to provide agriculture with technical means for mechanizing the work of applying fertilizers. But the provision of technical equipment and storage facilities for agriculture still lags behind the volumes of fertilizer deliveries. Up to this point industry has not mastered series production of machines for preparing fertilizer mixtures. It is necessary to accelerate the development and introduction into production of improved fertilizer mixing installations with precision dosing of the initial components, and to achieve unconditional fulfillment of the assignments for producing these installations and frontal tractor loaders for performing warehouse work. There are still a number of unsolved problems in the transportation of fertilizers from the plant to the field, which result in significant losses.

In the next few years special attention should be devoted to the creation and introduction into production of machines for applying the main doses of fertilizer by the local method. It is necessary to envision the assimilation of series production of special combined grain fertilizer feeders that are intended for local and separate application of the main doses of mineral fertilizers along with the planting of grain crops, and also machines for intrasoil local application of mineral fertilizers during subsoil tilling.

Serious attention should be given to questions of technical-economic and agrochemical evaluation of various variants of the system of providing agriculture with mineral fertilizers in the various individual economic regions and republics. This approach would make it possible to evaluate the economic aspect of the utilization of certain volumes of fertilizers in a specific economic region or republic of the country. It is also necessary to take into account the possible unfavorable weather conditions.

With an increase in the volume of production of mineral fertilizers large material funds are spent on their transportation from the plants to the consumers. In this connection there arises the question of the expediency of efficient distribution of the plants throughout the territory of the country. Moreover, as a result of shipping fertilizers with low concentrations, it is necessary to transport almost as much filler as nutritive substances over thousands of kilometers, and the kolkhozes and sovkhozes experience significant difficulties in applying to the soil these fertilizers with high filler content. Moreover, there is not enough of the necessary technical equipment for applying fertilizers. Obviously there is work for scientific institutions in this area. First of all they should seriously think about and give suggestions regarding the production of better forms of mineral fertilizers that guarantee highly effective utilization of nutritive substances by the plants without polluting the environment. Agriculture needs highly concentrated compound fertilizers with a given level of release of nutritive substances from the granules and deposits of fertilizers that are applied to the soils, according to the plants' needs in the various phases of their growth.

At the present time the most widespread method of applying fertilizers is the broadcast method, even though science has proved and practice has confirmed the expediency of local application of the main fertilizer to potatoes, grain crops, and several other crops, especially on heavy soil. It is necessary to do more research on this method--the effects of the degree of localization and various methods of spatial distribution of fertilizers on the plants' utilization of the nutritive substances, taking into account the soil, agrochemical and other factors, and to reveal conditions for its effective application in combination with other methods and to various crops.

It is necessary to do more extensive research on reducing losses of fertilizers through inhibition of processes of nitrification, capsulation and transformation of nitrogen in the soil; and for selecting non-retrograde forms and evaluating phosphorus fertilizers obtained from phosphorus raw material with low concentrations. Research is also necessary on highly effective utilization of non-chlorine and new, slow acting forms of potassium fertilizers.

Organic fertilizers constitute a large reserve for increasing the production of agricultural products and increasing the fertility of the soil. But they are frequently utilized poorly from beginning to end. No more than 50 percent of the immense masses of liquid manure that accumulate in animal husbandry facilities is utilized. Moreover, this pollutes the environment, the ground waters and the surface bodies of water. Efficient application of organic fertilizers in agriculture is of great national economic significance. According to calculations of specialists, as a result of correct utilization of organic fertilizers that are produced in the country, it would be possible to obtain no less than 20 million additional tons of crop growing products calculated in terms of grain. Good machines are necessary for applying to the soil the entire volume of organic fertilizers that are produced. It is necessary to develop technology and a complex of highly productive machines and equipment for applying liquid manure within the soil. These must provide for efficient utilization of nutritive substances and reduction of environmental pollution to a minimum.

It will be necessary to create more efficient methods of liming acid soils. Herein lie large reserves for increasing the fertility of the soil of the nonchernozem zone and increasing the productivity of the crops that are cultivated.

Microbiologists have completed a number of large theoretical and applied research projects for the development of scientific fundamentals and practical devices for utilizing useful forms of microorganisms in agriculture, particularly for creating scientific fundamentals and practical devices for increasing the fertility of the soil and the yields from plants. They have studied microbiological processes that bring about losses of nitrogen from various forms of fertilizers, depending on the soil conditions and the time periods and depths of their application. They have recommended more efficient agro-technical devices which reduce losses of nitrogen. It has been established that losses of gaseous nitrogen can be considerably reduced by applying nitrification inhibitors.

The All-Union Scientific Research Institute of Agricultural Microbiology has suggested methods of studying the transformation and mobilization of microorganisms of phosphates in the soil whose access is difficult. Important results have been obtained in studying processes of humification of plant residuals in the soil. For the first time in the country, microorganisms have been isolated which are capable of combining nitrogen in the air in an associative symbiosis with grass crops. Plant technology has been developed for producing rhizotorphene for alfalfa, clover, beans, lupine, soybeans and other leguminous crops. Rhizotorphene is considerably more effective than foreign analogs. The application of peat nitragin provides for a considerable increase in the yields, especially in regions that have recently begun to cultivate leguminous crops. The additional yield of soybeans amounted to from 2.6 to 7.2 quintals per hectare.

The development of effective means of increasing the productivity of leguminous crops is an important condition for increasing the fertility of the soil and making up for the shortage of protein. According to calculations of microbiologists, leguminous grasses can accumulate up to 150 kilograms of nitrogen per hectare in their roots and surface mass. With the existing areas planted in leguminous crops, agriculture annually obtains about 3 million tons of nitrogen through the joint activity of leguminous plants and rhizodium, which comprises approximately 40

percent of the quantity available to agriculture. Further research in the area of biological fixation of nitrogen will be very important in solving the most important problems of farming.

Scientists are faced with important problems for increasing the efficiency of the utilization of reclaimed land. Under the Eleventh Five-Year Plan the areas of reclaimed land will increase by another 7 million hectares and reach more than 40 million hectares by the end. It should be recognized that the productivity of the irrigated and drained land is still not great, and the yields of agricultural crops are increasing slowly. All this is related to the inadequate development of many questions of farming on reclaimed land.

The USSR State Committee for Science and Technology has approved for 1981-1985 a special-purpose comprehensive scientific and technical program for increasing the efficiency of reclaimed land and utilizing water resources in land reclamation. It envisions comprehensive development of problems of farming on irrigated and drained land and the introduction by the end of the five-year plan on the fields of the kolkhozes and sovkhoses new industrial technologies that provide for obtaining large yields of agricultural crops on irrigated land. The goal set in the program can be achieved on the basis of in-depth scientific research in the area of farming, chemization and land reclamation. It is intended to develop efficient measures for regulating the water, nutritive, saline, thermal and other conditions on reclaimed land in order to optimize them and the structure of the utilization of irrigated and drained land; schemata for specialized grain, feed and grass crop rotations on the basis of the application of progressive technologies and new technical equipment; and effective methods of cultivating and applying fertilizers to irrigated and drained land. The following complex research projects have been earmarked: for irrigation systems--avoiding repeated salinization, the appearance of solonchaks soil and swamping of irrigated soil and protecting it from wind and irrigation erosion; in drainage systems--creating optimal nutritives, water, air and thermal conditions of the soil, eliminating acidity and compounds that are harmful to the plants and reducing to a minimum losses of organic substances in peaty soils during mineralization and protecting them from wind erosion.

The decisions of the 26th CPSU Congress draw special attention to increasing the efficiency of scientific research on the basis of the utilization of modern methods and equipment. In recent years agronomy has begun to apply more extensively the latest achievements of science and technology in order to increase the production of agricultural products. For example, ionizing radiation is used for preplanting treatment of seeds in order to accelerate the processes of growth and development of plants, which leads to increasing the yield and improving its quality. Many years of experiments under field conditions have shown that, as a result of the application of this agricultural device, the productivity of wheat, buckwheat and corn increases by an average of 10-20 percent with improved product quality, cucumbers--by 10-28 percent, and potatoes--up to 15-20 percent.

Ionizing radiation is used in crop growing for creating new strains of agricultural plants (radiation mutants) which are characterized by improved economic and value indicators (increased yields, increased protein content and so forth). They are also applied for fighting against pests of agricultural crops with the method of radiation sterilization.

Broad possibilities are opened up to agricultural science by the method of tracer atoms, which are used to study plant nutrition, their assimilation of the nutritive substances of fertilizers, metabolism in animals, and so forth.

The introduction of equipment from nuclear physics (neutron-activation and x-ray-flourescent analysis) makes it possible to sharply increase labor productivity and the precision and quantities of analyses of the soil, plants and feeds, which is necessary for intensification and chemization of modern agriculture.

The automated nuclear physics complex that was created by the All-Union Scientific Research Institute of Fertilizers and Soil Science imeni D. N. Pryanishnikov serves more than 130 scientific institutions of VASKhNIL, the USSR Ministry of Agriculture, the USSR Academy of Sciences, and so forth, with an annual economic effect of more than 300 million rubles, and the investment in the installation was recouped in less than one year.

One automated installation for neutron activation analysis during an eight-hour shift analyzes 250-500 specimens simultaneously for the content of nitrogen, phosphorus, potassium and other elements, and it replaces the labor of 100 skilled analysts. Additionally, the cost of the analysis decreases to one-third the previous level.

Optic quantum generators are now being applied successfully in agricultural production. Lasar radiation of feeds provides for an additional yield of 15-20 percent and more. It is directly applied under closed conditions. Optic quantum generators are also used for controlling the water conditions of irrigated fields in order to optimize the irrigation. Lasar radiation, like ionizing radiation, is used for creating new strains of agricultural plants and increasing their resistance to various kinds of diseases.

The application of aerospace methods in soil science and agriculture has made it possible to increase 1.5-2-fold the efficiency of drawing up soil charts (precision and completeness of contents) as compared to other methods.

The agricultural sphere of production has also begun to introduce electromagnetic fields of ultrahigh frequency (EMP SVCh) to fight against weeds. In 1979 for the first time in the country work was conducted on the fields of the Siberian Scientific Research Institute of Agriculture to reveal the effects of EMP SVCh on weeds, crop plants (wheat and mustard) and the microflora in the soil.

On the basis of modern methods, the agrophysics scientific research institute has conducted original research for obtaining models of the dynamics of elements in soil fertility, including blocks of heat and moisture exchange, transformation of nitrogen, phosphorus and organic substances in the soil and other indicators, which were used for drawing up a program for controlling the technological process during the cultivation of grain crops, potatoes and the seeds of perennial grasses. The institute has developed instruments for obtaining information concerning the physiological condition of the plants, ways of measuring the moisture in the soil with an automatic irrigation system, a system for controlling and regulating the microclimate in vegetable storehouses, and so forth.

Under the Eleventh Five-Year Plan it will be necessary to expand research for the development of theoretical fundamentals for optimizing the physical condition of the root feeding layer and control of the physical condition for the formation of the harvest, which are extremely necessary in order to obtain the programmed yields.

Labor productivity in scientific institutions can be increased by automating research processes on the basis of developed information systems and the use of electronic computers. Only the first steps have been taken in this direction. It is necessary to concentrate the attention of scientists on a comprehensive approach to the utilization of electronic computers and to develop recommendations for interzonal and intrazonal optimal distribution of agricultural crops; the optimal sizes and distribution of animal husbandry complexes, taking into account the existing feed base; efficient utilization of industrial wastes; farm specialization, cooperation and agro-industrial integration; the scale and sequence of comprehensive measures that provide for efficient amelioration and assimilation of land; increased fertility of the soil, taking environmental protection into account; automated development of efficient regional stream technology; large planned yields of field crops, taking into account agro-climatic conditions; the creation of automated systems and technologies that guarantee preservation of the products and their qualitative indicators in the post harvesting period and during storage, through regulation of the storage conditions on the basis of information that is obtained concerning the condition of the products and the parameters of the environment in the storage facilities.

The use of electronic computers to develop economically substantiated economic decisions will provide for increasing the efficiency of agricultural production without additional investments--just through optimal expenditure of existing resources.

In connection with the changeover of agriculture to an industrial basis it is necessary to create for specialists of all levels instruments and means of measurement in order to obtain operational information concerning the condition of the fields, planted areas, parameters of the plants' nutritive environment, storage products, and existing agro-climatic conditions, which would make it possible to make on-the-spot optimal decisions concerning the performance of one technological process or another.

One should develop new technologies for accelerated plant growth, which is necessary for selection work; methods and instruments for express evaluation of the drought resistance and winter hardiness of plants as well as the germinative capacity of the seeds; and also artificial climate chambers that are equipped with information control systems for raising plants according to a given program with continuous observation of the formation of the yield and its regulation using microcomputers.

During the years of the Tenth Five-Year Plan the country's scientific institutions, headed by the All-Union Scientific Research Institute of Feeds, created more than 100 strains of feed crops that are 10-20 percent more productive than previously regionalized ones. Recommendations have been developed that make it possible to increase the production of feeds on plowed lands, hayfields and pastures by 30-40 percent and more, and there are also technologies for preparing haylage and silage

that provide for almost complete (95-97 percent) retention of the nutritive substances in the feeds.

Still, not enough attention is being devoted to research on the organizational and economic aspects of changing feed production into a specialized branch of agriculture, creating efficient feed storage facilities and mechanizing feed production. It is necessary to further strengthen the material and technical base of scientific institutions for feed production.

Under the Eleventh Five-Year Plan research in this area will be concentrated on the following developments: scientific fundamentals for the organization of specialized enterprises and associations for feed production in order to transform it into an independent branch of the national economy; an optimal structure for the areas planted in grain forage crops (barley, oats, corn and so forth); the creation of new, highly productive strains of grain forage and feed crops that meet the requirements of intensive farming; improvement of technologies for the utilization of reclaimed land in field and meadow feed production; progressive devices and technologies for the cultivation of feed crops; increased production of vegetable protein through increasing the productivity of high protein crops; improvement of the structure of the areas planted in feed crops; efficient application of mineral (primarily nitrogen) fertilizer, mowing the perennial grasses repeatedly; effective feed crop rotations, taking into account the concentration of animal husbandry and various kinds of specialization of the farms and complexes, and also technologies for creating and utilizing specialized pastures for various kinds of cattle in the various zones of the country; new devices and technologies for harvesting, preparing and preserving feeds that provide for high maintainence, good nutritive value and improved quality.

Taking into account the exceptional importance of the problem of feed production, its multifaceted nature and also the objective need to transform feed production into an independent specialized branch, it would be expedient to create within VASKhNIL a branch division for feed production. This will make it possible to essentially improve the coordination of scientific research on the problem, to concentrate the efforts of scientists of all institutions, regardless of their departmental jurisdiction, on solving the most crucial problems in the area of feed production, and to accelerate the introduction of new developments into production.

Unanimously approving the tasks earmarked by the party and government in the area of further development of agriculture, the scientists working in the area of farming and chemization of agriculture will spare no efforts or energy to carry them out successfully.

COPYRIGHT: Izdatel'stvo "Kolos", "Vestnik sel'skokhozyaystvennoy nauki", 1981.

11772

CSO: 1824/475

DETERMINING MINERAL FERTILIZER REQUIREMENTS, OPTIMUM DISTRIBUTION USING COMPUTERS

Moscow ZEMLEDELIYE in Russian No 7, Jul 81 pp 50-52

[Article by L.P. Dashkova, candidate of agricultural sciences at central institute of Agricultural Services; B.P. Loboda, Candidate of Agricultural Sciences and V.K. Smirnov, Kostroma Branch of Central Institute of Agricultural Services: "Determining Requirements and Optimum Distribution of Mineral Fertilizer Funds Using Electronic Computers"]

[Text] The FONUD-ES programming complex, developed at TsINAO [Tsentral'nyy institut agrokhimicheskogo obsluzhivaniya sel'skogo khozyaystva; Central Institute of Agrochemical Services for Agriculture], is making it possible, within a brief interval of time and with the aid of electronic computers, to determine the requirements for and the distribution of newly allocated mineral fertilizer funds. Various methods are being employed for this purpose and fertilizers applied earlier and the volumes of their use are being taken into account. Simultaneously with determining the requirements, the economic indicators for the effectiveness of fertilizers by crops and objects of consumption are being calculated. The optimum distribution of mineral fertilizer funds is carried out based upon the criterion of maximum effectiveness and taking into account such factors as the priority of the crops, the level achieved and the volumes of fertilizer usage, certain degrees of the directive organs and other limiting conditions.

In this regard, we studied and compared several methods for calculating the requirements and distribution of mineral fertilizer funds in behalf of the 1980 harvest and for rayons in Kostromskaya Oblast. Last year the oblast's farmers planned to produce 520,000 tons of grain, approximately 15,000 tons of flax, 250,000 tons of potatoes, 25,000 tons of vegetables and 800,000 tons of feed.

During the years of the Tenth Five-Year Plan, the amount of fertilizers applied increased by 21 percent and in 1979 it amounted to 236,000 tons in physical weight. Each hectare of planting was provided with an average of 118-126 kilograms of basic nutrients. Grain crops were supplied with 121 kilograms, potatoes -- 331 and flax -- 191 kilograms of active agent of nitrogen, phosphorus and potassium.

In order to ascertain the most optimum variant for the oblast, the fertilizer requirements were calculated using three methods and with the following factors being taken into account: the planned increase in yield based upon cropping power and without fertilizers; the proportion of the yield obtained by means of

fertilizers; the planned increase with regard to average cropping power during the preceeding years and taking into account the average amount of fertilizer applied during these years.

In the first instance, with the calculation taking into account the planned increase in yield with regard to cropping power and without fertilizers, use was made of the following initial information: the planned cropping power, the areas of the agricultural crops, the planned increase obtained by means of fertilizers, the cropping power without fertilizers under production conditions and the basic cropping power according to the norms and the fertilizer expenditures per unit of increase in yield. In the second method for calculating requirements, which takes into account the proportion of the yield obtained by means of fertilizers, additional thought is also given to the cropping power and to the increase in yield during field experiments when fertilizers were applied.

In the case of the third method of computation, we took into account the average cropping power of the agricultural crops during the preceeding years and the average amount of fertilizers applied during these years.

We obtained the following data as a result of the computations (the farm requirements for mineral fertilizers in Kostromskaya Oblast during 1980, for the different methods, in thousands of tons):

Computational Method	Total Amount of Fertilizer
First	371.4
Second	451.1
Third	400.7

In the computations and with the exception of the enumerated basic initial information, attention was focused on the correction factors for soil fertility and the norms for mineral fertilizer expenditures, determined on the basis of data from field experiments, and also coefficients for converting the nutrients of fertilizers into conventional units, the prices for the agricultural products and the content of the feed units and digestible protein in the agricultural crops. All of the computations for the fertilizer requirements and distribution of the funds were carried out from the standpoint of the agricultural crops for 24 rayons in Kostromskaya Oblast.

An analysis of the results of the mentioned methods for computing the requirements has revealed that the most acceptable one for the rayons in Kostromskaya Oblast is the computation according to the norms for fertilizer expenditures in order to obtain a unit of increase in yield and the proportion of the crop obtained by means of fertilizers.

The first method for computing the requirements according to the norms for fertilizer expenditures in order to obtain a unit of increase in yield and the planned increase in yield with regard to cropping power without fertilizers did not satisfy us, since owing to an absence of reliable data on the basic cropping power for a number of crops, under the conditions prevailing in the oblast, its requirements for fertilizers are lowered. In addition, for the achieved level of use the fertilizers are not redistributed in an optimum ratio and this can bring about a shortfall in yield.

The third method of computation according to the norms for fertilizer expenditures in order to obtain a unit of increase in yield and a planned increase with regard to the average cropping power for preceeding years, and taking into account the average amount of fertilizer applied during these years, lowers the requirements for fertilizers owing to the fact that last year, in a number of rayons throughout the oblast, the planned cropping power accepted was lower than the average cropping power for the previous five-year plan. Moreover, the ratio of the nutrients in the soils did not conform to the optimum ratio. Thus, in the soils in Antropovskiy, Vokhomskiy, Mangurovskiy and Ponazyrevskiy Rayons the ratio of nitrogen and phosphorus and in the soils of Vokhomskiy, Neyskiy, Parfen'yevskiy, Sudislavskiy and Susaninskiy Rayons the ratio of nitrogen and potassium exceeded the optimum amounts by a factor of 1.2-1.5 and, conversely, in the soils in Kadyyskiy, Kologrivskiy, Krasnobel'skiy and a number of other rayons this ratio was considerably lower than optimum. The availability of such information enabled us to reject the third method for computing the fertilizer requirements.

Table 1

Normative Effectiveness of Fertilizers on Agricultural Crops in Kostromskaya Oblast*

Crop	Normative Effectiveness of Fertilizers (rubles)	Fertilizer Availability for Planned Level of Cropping Power (%)
Vegetables	56.4	140.9
Potatoes	24.47	128.0
Flax	21.78	149.6
Root crops	20.33	173.0
Silage crops	6.23	258.0
Perennial grasses for hay	3.91	100.5
Improved haying lands	3.79	117.2
Peas	3.64	170.7
Winter rye	2.75	100.9
Wheat	2.67	108.8
Winter wheat	2.41	107.1
Barley	2.37	119.0
Improved pastures	2.3	100.1
Oats	1.87	103.1
Annual grasses for hay	1.1	102.6
Perennial grasses for green feed	0.77	100.0

* The term normative effectiveness of fertilizers is understood to mean the ratio of the value of the planned increase in agricultural crop yield, by means of fertilizers and in comparable prices, to the cost of the fertilizers which made it possible to obtain this increase.

It has been established that under the conditions which prevail in Kostromskaya Oblast the greatest results are obtained from fertilizers when they are applied in behalf of vegetable crops, potatoes, flax and root crops. Here, each ruble of fertilizer cost, in terms of the normative effectiveness, produces a gross output

of 20-56 rubles. The least effect is achieved when fertilizers are applied in behalf of oats, annual grasses for hay and perennial grasses for green feed (see Table 1).

Table 2

Economic Effectiveness of Optimum Distribution of Fertilizer Funds in Kostromskaya Oblast, in Accordance With the FONUD-ES Programming Complex

Agricultural Crop	Planned Gross Yield (thousands of tons)	Gross Yield Ensured by Availability of Fertilizers (thousands of tons)	Increase in Gross Yield (thousands of tons)	Cost of Increase in Comparable Prices (thousands of rubles)
Grain crops, total	520	563.1	43.1	2260.2
Winter rye	123.2	124.3	0.1	9.3
Winter wheat	21	22.5	1.5	109.4
Barley	179.4	213.5	34.1	1822.1
Oats	191.8	197.7	5.9	272.5
Wheat	4.3	4.7	0.4	27.9
Peas	0.3	0.5	0.2	18.9
Spinning flax	14.9	22.4	7.5	10972.7
Potatoes	248.9	318.7	69.8	7397.5
Vegetables	25	35.2	10.2	1083.3
Forage crops, total	800.9	925.8	124.9	1400.8
Root crops	38.8	67.1	28.3	592.6
Silage crops	59	152.4	93.4	737.5
Annual grasses	79.6	81.7	2.1	19.8
Perennial grasses for hay	208.2	209.2	1.0	49.4
Perennial grasses for green feed	415.3	415.4	0.1	1.4
Improved haying lands	52.6	61.7	9.1	224.6
Improved pastures	22.2	22.2	-	0.4
Total				23539.7

Based upon the distribution of the fertilizer funds allocated and the normative requirements for them for the principal agricultural crops, we computed the degree to which the planned level of cropping power would be achieved by the mineral fertilizers. For such crops as potatoes, vegetables, flax, peas, root crops and silage crops, the planned level of cropping power provided by fertilizers can be increased by a factor of almost 1.3-2.6 times. On the whole, the computations carried out for the oblast using the FONUD-ES programming complex are making it possible to employ a new approach in solving the problems associated with optimum planning for the distribution of fertilizers and to improve the existing technology for approximate computations by the oblast station for the use of chemical processes and agricultural control, of the oblast executive committee, with regard to the distribution of fertilizers among rayons throughout the oblast.

In addition and according to our computations, the proposed optimum distribution of fertilizers and the anticipated growth in cropping power throughout the oblast,

and assuming more rational utilization of the fertilizers, may make it possible to obtain 23.5 million rubles worth of additional agricultural products, or 33.2 rubles worth from each fertilized hectare of arable land (see Table 2). In the process, the true economic effect realized from the application of fertilizers will amount to 9 rubles and 96 kopecks per hectare and from the entire area under crops in the oblast -- roughly 7.07 million rubles. In addition, the direct economic savings realized from the use of an electronic computer, in terms of eliminating the work of specialists attached to the planning organs for carrying out just one computation, amounted to 2,400 rubles.

Table 3

Increase in Feed Units and Digestible Protein With Optimum Distribution
of Fertilizers for Forage Crops in Kostromskaya Oblast (thousands of tons)

Crop	Planned Yield		Increase in Gross Yield From Optimum Distribution of Fertilizers	Increase From Optimum Distribution of Fertilizers	
	Feed Units	Digestible Protein		Feed Units	Digestible Protein
Root crops	5.043	0.349	28.3	3.7	0.3
Silage crops	8.7	0.6	93.4	13.7	0.9
Annual grasses	36.6	0.7	2.1	0.97	0.02
Perennial grasses for hay	93.0	13.7	1.0	0.45	0.07
Perennial grasses for green feed	190.2	20.3	0.1	0.05	0.01
Improved haying lands	23.7	2.6	9.1	4.1	0.45
Improved pastures	10.0	1.1	-	-	-
Total	367.2	39.3	-	22.97	1.75

Through the optimum distribution and use of fertilizers in behalf of forage crops and by raising the yields and yield quality on haying and pasture lands throughout the oblast, it will be possible to obtain approximately 23,000 additional tons of feed units and 1,700 tons of deficit digestible protein required for the feed balance (see Table 3)

In connection with the unfavorable climatic conditions experienced during the 1980 growing season, with the total amount of precipitation exceeding the annual norm by 250-300 percent, a considerable portion of the plantings were subjected to excessive dampness and this led to partial destruction of the grain, flax and potato crops and shortfalls in their yields. This caused reductions in the cropping power of the agricultural crops compared to the plan: grain crops -- a twofold reduction, potatoes -- by a factor of 1.5 and forage crops -- by a factor of 1.3. Hence the profitability of use of mineral fertilizers amounted to only 8-10 percent, that is, a net income of 8-10 kopecks was obtained per ruble of expenditure. On the whole, the oblast's net profit amounted to 1.38 million rubles. The effectiveness realized from the distribution of the funds by types among the rayons was raised by 10 percent, or by 138,300 rubles. When the fertilizer funds were redistributed based upon electronic computer computations,

irrational fertilizer transport operations were reduced within the oblast and a savings was realized in the sense that no manual labor was employed in carrying out the computations. The economic effectiveness of introducing computations for the distribution of mineral fertilizer funds for 1980, using the FONUD programming complex and taking into account the actual crop yields for Kostromskaya Oblast, is expressed by the following data:

Reduction in irrational transport operations from the redistribution of the funds among the rayons	19,600 tons
Monetary savings from a reduction in irrational transport operations	16,100 rubles
Net profit from the use of fertilizers	1,383,000 rubles
...including through the redistribution of fertilizers by types (10%)	138,300 rubles

Thus the experience in computing the fertilizer requirements for Kostromskaya Oblast and distributing the fertilizers among the oblast's rayons, using an electronic computer, underscores the high effectiveness of the programming complex employed and the feasibility of its annual use, while taking into account the changes in the planning indicators for cropping power and in the fertilizer funds being made available.

COPYRIGHT: Izdatel'stvo "Kolos", "Zemledeliye", 1981

7026

CSO: 1824/469

END

END OF

FICHE

DATE FILMED

2 NOV 1981